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Large Inquiries for Pig Iron

The Deadlock Continues as to 1911 Deliveries

A Gradual Shrinkage in Output of Finished Material

Producers and consumers of iron and steel continue to keep in close step, and it is recognized that for some time distributers and buyers will work on a minimum margin of stocks. With some exceptions, chiefly in pig iron, contracting for far-forward deliveries will be avoided until more can be found out of the probable extent of the revolution now under way in politics and business.

Pig iron has had most attention in the past week, but even here it is chiefly inquiry for next year that is reported. Normally heavy buying for the new year would be in order this month, and consumers are showing interest, but furnaces do not want 1911 business at this level. It remains to be seen to what extent this position will change as the month advances. In the East particularly there is talk of blowing out more furnaces, now that the end is being reached of the profitable contracts taken early in the year.

The pig iron buying of the week has been mainly from pipe works. In the Philadelphia district a contract for 18,000 tons of Southern iron, 3000 tons a month, has been renewed, and additional purchases of pipe iron have amounted to 8000 to 10,000 tons. Eastern Pennsylvania and Virginia pipe works are in the market for a total of 11,000 tons for this year. Southern furnaces report that business offered for next year is large, including a lot of 10,000 tons and one of 15,000 tons. Radiator works are inquiring for 40,000 to 50,000 tons for 1911. The general run of gray iron foundries are watching the market closely and taking on small amounts to piece out the year. Southern sellers for the most part hold to $11.50 for No. 2 iron, but $11 sales are still reported.

In basic iron a round lot has been sold for New England delivery, while several 2000-ton inquiries are pending at Philadelphia. Cincinnati reports that a nearby steel plant has asked for 25,000 to 30,000 tons of basic.

The United States Steel Corporation is operating 67 per cent. of its blast furnace capacity, 45 furnaces being now idle, against 42 September 1, 39 August 1, 35 July 1 and 31 June 1.

Steel billets and sheet bars are weak and on the former buyers are able to get concessions from $24.50, Pittsburgh maker's mill.

In the main new business in finished steel is better than in August. Since the operation of steel works is being adjusted closely to demand and the latter is almost wholly from hand to mouth, production shows a gradual shrinkage. The Steel Corporation's announcement of 433,000 tons reduction in unfilled orders

in August is to be interpreted in the light of this fact, though of course the figures furnish no gauge of the rate of shipments or the rate of new bookings last month.

The various steel companies are operating at from 65 to 80 per cent. of their capacity and taking new business at, say, 50 per cent. of capacity, but the new bookings are more dependable than the usual run of contract business.

The wire trade apparently leads in activity. Competition is sharper on some of the heavier products, cuts of $1 a ton being made on narrow and medium width plates.

Low prices continue on fabricating contracts. The subway extensions in New York City will make a large demand on the structural mills, but it will be spread over the next three years. The estimates of steel required, including rails, bars and wire, range from 150,000 to 225,000 tons, depending on the mileage decided on after the bids are received this month on the general contract.

Export rail business is good, sales of 25,000 tons being made by the Steel Corporation for shipment to Australia, besides fair orders to Brazil and other countries. Most of the recent domestic business has gone to the Colorado mill. The Tennessee Company has closed 3000 tons for the Texas Mexican Railway.

Several Lake Superior iron mines have been shut down and the output of others is being curtailed.

In the metal market tin is still the feature. Domestic consumers are buying at the prices fixed by the recent speculation, representing the highest level in three years.

Average Blast Furnace Output 100,000 Tons Per Annum

It is of interest to note that the average output per year of the coke and anthracite blast furnaces of the United States that have been in operation this year has been close to 100,000 tons. In February, when 313 of such furnaces were in operation, their yearly rate of production figured out about 31,250,000 tons. Charcoal furnaces at the same time produced about 400,000 tons additional. Between February 1 and September 1 there was a net reduction of 70 in the number of coke and anthracite furnaces active, so that at 100,000 tons a year the yearly rate of the 243 furnaces in blast at the opening of this month would be 24,300,000 tons. Our statistics showed that the daily capacity of these 243 furnaces, based on their performance in August, was 66,469 tons. Multiplying by 365 gives 24,265,185 tons, or very close to the above figure based on a 100,000-ton yearly average.

Theoretically, the furnaces dropping out of the active list under conditions such as have caused an average decrease of 10 furnaces a month in the past seven months would be those of smallest output and highest cost of production. The fact appears to be, from the maintenance of the same average output with only 243 furnaces running as with 313, that stacks of large capacity and presumably of economic production have contributed to the curtailment in considerable measure. In the case of the Steel Corporation, for example, the idle list includes important furnaces, particularly a number whose product enters into pipe and tubes, as well as the smaller ones at Zanesville and Columbus, Ohio, in the Wheeling district and at Bessemer, Ala.

The high capacity furnaces in blast September 1 far outnumber the small furnaces, 154 producing at a rate greater than 100,000 tons a year, while 89 were below that rate. One factor is to be considered that is not represented in the mere presentation of the figures. The largest furnaces of the steel companies have not been making iron up to their capacity for some months, moderate running being considered preferable, for a number of reasons, among which is the desirability of holding working organizations, to a concentration of production at fewer plants. In August most of the larger stacks made 13,000 to 13,500 tons, or 410 to 425 tons a day, while in but few cases was 14,000 tons reached. At full driving of the largest furnaces an average above 100,000 tons a year would have been recorded September 1. But apart from this consideration, the figures indicate a tenacity on the part of the smaller furnaces that under present market conditions is surprising.

For comparison with the 100,000-ton rate of the coke and anthracite furnaces, in blast this year, we turn to the blast furnace statistics of *The Iron Age* 10 years ago. On March 1, 1900, 264 such furnaces were in blast, with an average capacity of 57,264 tons a year. On June 1, 1900, there were 266 in blast, with an average capacity of 57,572 tons, and on September 1, 197 were active with an average capacity of 59,020 tons a year. The increase represented by an average capacity of 100,000 tons in 1910 is thus seen to be 75 to 80 per cent. in 10 years.

Going back 20 years, or to 1890, another basis of comparison is found. In his well-remembered paper in that year before the American meeting of the Iron and Steel Institute, James Gayley cited the phenomenal record of 113,526 tons in 12 months for the Edgar Thomson furnace which had blown in in 1889, this comparing with the best previous record of 88,940 tons. Thus what was an almost incredible performance 20 years ago is to-day but little in excess of the average of all coke furnaces, great and small. However, for several well-known reasons there is no approach to-day to the average of 1892 lb. of coke to the ton of pig iron, as given in Mr. Gayley's paper.

As another comparison we turn to the report of pig iron production in Great Britain in 1909. The average number of furnaces in blast was 319¾ and the average annual output per furnace was 30,224 tons, as compared with 29,375 tons in 1908 and 27,096 tons in 1907.

Steel Tubes

The manufacture of steel tubing has grown until to-day such tubes constitute one of the large divisions of fundamental forms, comparable with rails, plates, structural shapes and rods. The business is the legitimate successor of the manufacture of wrought iron tubing. But here the change of material introduced two problems not connected with the manufacture, but with the use itself. One of these was quickly solved—that which related to the rather unexpected difficulty of threading tubes of the new and tough material. The other, which has reference to the question of corrosion, is, perhaps, yet to be solved. The question is, after all, a comparative one, whose practical equivalent is, Does steel tubing corrode more rapidly than wrought iron? This would seem to be a really vital question, and yet, in spite of the uncertainty in which

the answer to it has been involved, the substitution of steel for iron goes steadily on. There seems to be no considerable section of the tubing business where this is not the case.

But the steel tube is not by any means engaged merely in taking the place of the iron tube. It is being applied to numberless new uses. This result is, no doubt, largely due to other causes than the change of material. The steel tube is, doubtless, stronger and stiffer and has a greater resistance to wear. These are important considerations, but scarcely sufficient to account for the facts. The wonderful expansion of the tube industry is due more especially, it would seem, to the wonderful development of the methods of manufacture.

Probably the first considerable demand for metal tubes arose in connection with their use as musket barrels and the like. This demand was scarcely large and steady enough to bring about any real mechanical development. But the introduction of gas for lighting purposes supplied the incentive needed to yield an economical process. Lap welding had already been employed in the manufacture of gun barrels. But methods founded on the idea of butt welding and looking to rapidity of production began to be developed. One method employed the rolling mill; another made use of the draw bench and the conical die. Welding processes are in large use to-day, and tubing thus produced has its own extensive and proper field.

But there are two principal difficulties in these modes of manufacture which tend to restrict application. If the weld is imperfectly made, certain uses of tubing will operate to open the joint. Moreover, any hot process carries with it a degree of inaccuracy of dimensions. Now, there is probably no commercial method of producing wrought iron or steel tubing in existence at present that does not involve one or more hot operations. If accuracy is to be secured in the final product, it is a question, then, of using such a hot operation that the inevitable inaccuracy is of such a character as to permit of subsequent elimination. The final operation must be a cold one.

The Mannesmann methods originated a quarter of a century ago and since brought to a high state of perfection supply a hot procedure which meets all requirements. There is no seam and so no possible imperfection of weld. It is sufficiently accurate to permit hot elongation and a final cold drawing to exact size. When to these considerations are added rapidity, certainty and economy of production the system appears to conform in very important particulars to modern ideals.

There is one other question to which a satisfactory answer must be given in order that seamless cold drawn tubing may be all that it should be. That question relates to uniformity and high quality. There is, no doubt, some inequality of stress in the walls of the billet when it leaves the piercing mill—some distortion of fiber. This imperfection is, doubtless, inherent in present methods, and may perhaps be inseparable from them. Still great progress has already been made in this direction, which would seem to indicate that practical perfection may be possible. For the present restorations possible through annealing processes must answer. That a high quality of low carbon steel tubing may be produced by disk perforation of the billet and cold drawing of this rough tube subsequent to its elongation by the rolling mill, if the annealing is well attended to, would seem to be indicated by the deformations to which the product may be subjected without rupture of the walls.

The great variety of forms and sizes which may now be obtained without trouble is a great advantage to the user, and tool steel tubes are also obtainable. The minute varieties are certainly marvels of skill and ingenuity.

Direct Pumping with Gas

Direct acting steam pumps are notoriously inefficient, but their simplicity, reliability, the little attention they require and their relatively moderate first cost have long been considered sufficiently redeeming to hold the field for them in the handling of moderate quantities of liquid. When the quantity is sufficient, as in a city's water supply, to warrant pumping engines, very excellent economies according to older standards have been obtained. The position of the steam pumping engine has been the last to be assailed by the gas engine, for under ordinary circumstances a gas engine driven pumping set does not offer the advantages to commend it. In the straight power field the gas engine has found its place and will continue to grow in popularity, but it comes as rather of a startling proposition that the economy of the latter may be contested by a prime mover in which gas will be used to pump water and the water to drive turbines, either for the direct furnishing of power or the generating of electricity. It has not only been proposed with the Humphrey combustion pump, but there is now under construction in Germany apparatus to test out the commercial possibilities of thus generating power.

A description of the Humphrey pump appears in another part of this issue. One of these pumps at Brussels is now attracting possibly more attention than any other exhibit in the machinery section of the exposition, and at the recent joint meeting of the mechanical engineers in England the demonstration of these pumps was one of the most interesting things witnessed on any of the technical excursions. The inventor of these pumps, an expert in the field of gas power engineering, took up the problem about four years ago of producing a simple, strong pump in which the explosive force would be exerted directly upon the water, going back to an idea that originated about 1868. He avoided, however, what had been the pitfall of the earlier experimenters—the placing of a nonreturn valve in the water line—and instead of seeking to master the difficulties they had encountered in controlling the movement of the incompressible liquid, he turned about and made that movement of actual service in the control of the pump, and with very interesting consequences.

The article above referred to explains the action of the pump, but it is worthy of some emphasis that with his new principle he has obtained so much more nearly the conditions that are ideal for any gas engine. As enumerated in a paper presented by the inventor before the Institution of Mechanical Engineers, these are ability to give four unequal strokes (this to obtain a higher than the theoretical efficiency of an Otto cycle); use of the whole possible range of expansion down to atmospheric pressure; energy delivered direct to the flywheel without intermediate parts; internal cooling

so that the cylinders may be of any size within structural possibility; ignition automatic and depending only on the compression, pressure and elimination of contraction and expansion difficulties. What he has eliminated as unnecessary are a rotating solid flywheel, solid piston, connecting rod, crank, bearing or glands of any sort; in short, moving parts of all kinds except the few inseparable from the operation of the valves. The pump has shown exceptional economy even in the relatively small capacities which have so far been built and tested, but it is not at all unlikely that these will be considerably exceeded by the larger pumps with higher compression, the building of which is now contemplated. In fact, so great a gain in economy is anticipated that even with the mechanical losses that will be introduced in using the pump to develop power through water turbines it is confidently believed that the economy of a straight gas engine will be exceeded. Aside from this prospect there are so many applications possible in the field of pumping alone in which the pump promises greater reliability, greater simplicity and greater economy, that it cannot but demand serious attention from the engineering world.

Germany Close to Great Britain in Iron and Steel Exports

We have already referred to the way in which Germany has been overhauling Great Britain in the race for the world's markets for iron and steel products. From 838,000 tons in 1900, or little more than one-fourth the British total of 3,213,000 tons, German exports of iron and steel had advanced to 3,732,000 metric tons, against 4,233,000 gross tons for Great Britain in 1908, and last year the respective totals were 4,044,000 and 4,380,000 tons. In the first half of this year Germany made a slight further gain, with a total of 2,307,000 metric tons, against 2,371,000 gross tons for Great Britain. Including machinery exports, which were 247,000 metric tons from Germany and 321,000 gross tons from Great Britain, the totals become 2,554,000 and 2,692,000 tons.

The increase in the rate of export from Germany over the record made last year is remarkable, and may well cause serious thought in Great Britain on the position of that country in the international iron and steel trade. As indicating the different lines on which the two countries have developed their foreign trade in iron and steel the London *Iron and Coal Trades Review* has prepared the following table showing the distribution of the exports of each:

Iron and Steel Exports from Great Britain and Germany, First Half of 1910.

	From Great Britain. Tons.	From Germany. Tons (metric).
Pig iron and ferro	618,693	382,362
Scrap	94,000	73,139
Rails	225,371	207,801
Chairs and sleepers	35,672	89,928
Wheels, axles and tires	25,000	31,309
Ingots, blooms, billets, &c.	1,512	250,185
Cast iron pipe	93,727	20,428
Tubes and fittings	86,236	69,352
Galvanized sheets	298,266	11,266
Tin plates	239,309	149
Other plates and sheets	119,333	185,821
Wire and wire products	58,697	258,805
Forgings and wrought manufactures, projectiles, &c.	32,374	48,000
Castings and machinery spares	37,663	43,968
Sections, girders, &c.	250,488	516,322
Hoops and strips	24,663	58,440
Anchors and chains	14,377	5,894
Bolts, nuts, screws and rivets	23,532	23,000
Unenumerated	92,846	31,334

It will be noticed particularly that Great Britain is a large exporter of pig iron, but practically ships no semifinished steel; that Germany is a smaller shipper of pig iron, but an important exporter of blooms, billets, sheet bars, &c., sending considerable of this steel to the United Kingdom. In galvanized sheets and in tin plates Great Britain is particularly active, while Germany does little or nothing. In wire products Germany is far in the lead, and in shapes and fabricated material does twice as much as Great Britain. In rails the two countries are not far apart. Our contemporary is disposed to the view that the race may not be so swift in the coming year, believing that the depressed state of the German iron trade in the first half of this year made competition from that source unusually keen. There is no certainty, however, that the immediate future will bring a reversal of this condition, and the outstanding fact about German iron and steel companies is that their capacity is expanding rapidly, and that the producing cost of the new plants is low. No signs appear of any deviation from the condition which our British contemporary alludes to as the "remarkable fact that as the largest exporters of pig iron, which relatively requires little labor, and of sheets and tin plates, which relatively require a large amount of labor, we are unable to compete successfully with Germany in intermediate products such as billets, sheet bars and sectional iron and steel."

The Steel Corporation's Unfilled Orders August 31

The second of the monthly statements of unfilled orders of the United States Steel Corporation was published September 10. It showed orders on hand August 31 of 3,537,128 tons, or 433,803 tons less than on July 31. The reduction in July was 286,863 tons. The total of August 31 is the smallest since September 30, 1908, and the latter date and June 30, 1908, were the only times in the last depression when unfilled business as published was less than at the beginning of the present month. Below are given the various reports of unfilled orders, beginning with the third quarter of 1902:

August 31, 1910	3,537,128	September 30, 1906	7,936,884
July 31, 1910	3,970,931	June 30, 1906	6,809,859
June 30, 1910	4,257,794	March 31, 1906	7,018,712
March 31, 1910	5,402,514	December 31, 1905	7,605,086
December 31, 1909	5,927,031	September 30, 1905	5,865,377
September 30, 1909	4,796,833	June 30, 1905	4,829,655
June 30, 1909	4,057,939	March 31, 1905	5,579,569
March 31, 1909	3,542,597	December 31, 1904	4,696,203
December 31, 1908	3,603,527	September 30, 1904	3,027,436
September 30, 1908	3,421,977	June 30, 1904	3,192,277
June 30, 1908	3,313,876	March 31, 1904	4,136,961
March 31, 1908	3,765,343	December 31, 1903	3,215,123
December 31, 1907	4,624,552	September 30, 1903	3,278,742
September 30, 1907	6,425,008	June 30, 1903	4,666,578
June 30, 1907	7,603,878	March 31, 1903	5,410,719
March 31, 1907	8,043,858	December 31, 1902	5,347,523
December 31, 1906	8,489,718	September 30, 1902	4,843,007

The Western Steel Corporation Buys Nevada Iron Mine.—The Western Steel Corporation, Seattle, Wash., which is now operating a blast furnace and an open hearth steel plant at Irondale in that State, announces its purchase of the Dayton iron mine in Lyon and Storey counties, Nev. The property consists of 240 acres, and the purchase price named is $200,000. It was bought from James Wales Smith, Los Angeles, Cal., and Alfred Merritt, one of the discoverers and developers of the Mesaba range. The ore is hematite, and it is said that much of it runs 63 per cent. in iron with phosphorus under the Bessemer limit. In a report made by R. N. Dickman when the property was optioned to the late E. H. Harriman, the amount of definitely determined ore was put at 14,000,000 tons, and it is considered probable that the deposit will prove much greater than this.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept.14, 1910.	Sept.7, 1910.	Aug.10, 1910.	Sept.15, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$18.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	16.50	16.50	16.50	18.50
Basic, delivered, eastern Pa.	*15.00*	15.00	15.25	18.00
Basic, Valley furnace	*13.75*	13.75	14.25	15.75
Bessemer, Pittsburgh	*15.90*	15.90	16.15	17.90
Gray forge, Pittsburgh	*14.15*	14.15	14.40	15.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	25.00
Forging billets, Pittsburgh	*29.00*	29.00	30.00	29.00
Open hearth billets, Philadelphia	*27.00*	27.00	27.50	27.50
Wire rods, Pittsburgh	28.00	28.00	28.00	31.50
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	16.50
Steel rails, melting, Philadelphia	13.75	13.75	13.75	17.25
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	20.00
Car wheels, Chicago	*14.00*	14.00	14.50	18.50
Car wheels, Philadelphia	*13.75*	13.75	14.00	17.00
Heavy steel scrap, Pittsburgh	**14.50**	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	13.75	13.75	13.75	17.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.52
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.45
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.50
Steel bars, tidewater, New York	1.56	1.56	1.56	1.56
Steel bars, Pittsburgh	1.40	1.40	1.40	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.40*	1.45	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.50*	1.55	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.15	2.20	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.87½*	12.87½	13.00	13.50
Electrolytic copper, New York	12.62½	12.62½	12.62½	13.00
Spelter, New York	**5.50**	5.40	5.20	5.85
Spelter, St. Louis	**5.35**	5.25	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.30	4.30	4.30	4.30
Tin, New York	**34.80**	36.20	33.37	29.90
Antimony, Hallett, New York	*7.87½*	7.87½	8.00	8.37½
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c. base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 8 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, 1.55c. to 1.60c.; Nos. 9 and 10, 1.60c. to 1.65c.; Nos. 11 and 12, 1.65c. to 1.70c.; Nos. 13 and 14, 1.70c. to 1.75c.; Nos. 15 and 16, 1.80c. to 1.85c. One pass, cold rolled box annealed sheets: Nos. 15 and 16, 1.90c. to 1.95c; Nos. 17 and 21, 1.95c. to 2c.; Nos. 22 and 24, 2c. to 2.05c.; Nos. 25 and 26, 2.05c. to 2.10c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c. to 2.05c.; Nos. 17 to 21, 2.05c. to 2.10c.; Nos. 22 to 24, 2.10c. to 2.15c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¼ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	59	55
6 to 13 in.	61	43

2¼ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, September 14, 1910.—(*By Telegraph.*)

Pig Iron.—The local inquiry is light and nearly altogether for small lots. It is claimed that stocks in the valleys showed a slight decrease in August. We quote Bessemer iron at $15; basic, $13.75; No. 2 foundry, $13.75 to $14; malleable Bessemer, $14.25, and gray forge, $13.25, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—Inquiries for billets and sheet and tin bars are not quite as active as a week or two ago. We quote: Bessemer 4 x 4 in. billets, $24.50; Bessemer sheet bars, $25.50; open hearth billets, 4 x 4 in., $25 to $25.50; open hearth sheet bars, $26 to $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

Ferroalloys.—There is some inquiry for ferrosilicon in the market, and several small lots have already been closed. This material is somewhat scarce and is bringing higher prices for prompt shipment than for forward delivery. We quote 50 per cent. at $56.50, Pittsburgh, for prompt shipment, and $55.50 for forward delivery. The market on ferromanganese is firmer, and $39.50, Baltimore, seems to be minimum.

Labor Notes.—The bimonthly examination of sales of the Republic Iron & Steel Company and other bar iron makers was made here Tuesday, and showed that average prices on shipments of bar iron in July and August did not warrant any advance in puddling for September and October. The conference held here Tuesday between the Sons of Vulcan and a number of the bar iron makers adjourned without a settlement being reached on the puddling scale. It is probable that some of these employers will now take puddlers belonging to the Amalgamated Association and refuse to treat further with the Sons of Vulcan as an organization.

This morning eight hot tin mills in the Laughlin Works of the American Sheet & Tin Plate Company at Martin's Ferry, Ohio, and five of the hot sheet mills in the Ætna-Standard Works at Bridgeport were started up. It is probable that additional mills in these plants will be started within the next week.

(*By Mail.*)

Signs of encouragement are not lacking. This is especially true of finished iron and steel, the new demand for which is showing betterment in spots, and many orders are coming in to the mills with urgent requests, sometimes by wire, for prompt shipment and even for car numbers, which is taken to mean that stocks held by distributers all over the country are very much depleted. The market, however, lacks the snap that is always present with an active demand, and this is due to the fact that the jobbing trade and consumers are persistently pursuing the policy of limiting their orders to cover actual needs. There is really not much incentive to anticipate future requirements, the market being only fairly steady. It is, nevertheless, a remarkable condition that exists to-day in the iron trade in the matter of prices, which have been quite well maintained in the face of the fact that the demand for the past four or five months has been so largely of a hand to mouth character. There has been no disposition on the part of any of the large steel interests to jump in the market and demoralize prices to get business. Of course there are weak spots here and there, but, on the whole, the market is not showing any signs of distress. The new demand for pig iron in the past week has been very dull and there are no large inquiries out. There is some buying in small lots of basic, Bessemer and foundry iron, but much of this demand is being supplied by dealers who have accumulated some pig iron and are selling it in many cases at lower prices than the furnaces will name. It is admitted on all sides that too much pig iron is being made and until the output is cut down, or consumption increases, there is not much chance for better prices. There is not much new inquiry for steel billets or sheet bars and prices are soft. Steel mills located in districts outside of Pittsburgh are naming about $24 on soft Bessemer billets and about $25 on sheet bars, but with a freight of $1 a ton to Pittsburgh, these prices are higher than the local market. Some steel in the form of sheet and tin bars is in the hands of dealers, and in instances lower prices are made by them than the mills will name. New orders and specifications on finished iron and steel so far this month are about as good as in August, but it is doubtful if September will show an increase over last month, as had been expected. The scrap trade is showing betterment in demand and prices now being quoted by dealers are from 25c. to 50c. a ton higher than a week or two ago. Coke is dull and neglected, with low prices ruling. The coke trade is badly overdone and there does not seem to be much prospect for early improvement.

Ferromanganese.—Some new inquiry has come up in the last few days and we note sales of two small lots, amounting to about 100 tons, on the basis of about $39.50, Baltimore. We quote foreign 80 per cent. at $39.25 to $39.50, Baltimore, for reasonably prompt shipment, the freight rate to Pittsburgh being $1.95 a ton.

Muck Bar.—As no settlement has yet been made on the puddling and muck bar scales with the Sons of Vulcan there is a scarcity of muck bar for prompt shipment, which accounts for the present high prices. Best grades of muck bar made from all pig iron readily bring $29.50 to $30, Pittsburgh, for prompt shipment, a sale of 300 tons being reported by a local mill at the latter price. This producer employs nonunion puddlers.

Rods.—There is some new inquiry in the market and sales of 400 to 500 tons of open hearth and chain rods have been made on the basis of about $28, Pittsburgh. We quote Bessemer, open hearth and chain rods at $28, Pittsburgh, but Bessemer rods are not so strongly held as open hearth.

Skelp.—A local consumer of both iron and steel skelp of the wider sizes has placed 6000 to 8000 tons. We note sales of about 4000 tons of wide sheared steel plates at 1.40c. and 3000 to 4000 tons of sheared iron plates at 1.85c. and 1.90c., Pittsburgh. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Steel Rails.—The Carnegie Steel Company has received in the past week some new orders for small lots of standard sections and has also booked through the United States Steel Products Company several fair sized contracts for standard sections for export. The new demand for light rails from the coal mining and lumber interests continues active, the Carnegie Steel Company having taken quite a large tonnage in the past week. The three Edgar Thomson rail mills at Bessemer continue in operation to about 60 per cent. of capacity and have a fair amount of work ahead. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—In the past week local fabricating concerns have sent in bids on 2200 tons of bridge work in Ohio, 2000 tons in West Virginia and 800 tons for a store building in Oakland, Cal. No jobs worthy of note have been placed in this market in the past week, and complaint is still being made that prices being named on fabricated work are very low, and in some cases are below actual cost, unless concessions on plain material are being made by the mills. We quote beams and channels up to 15-in. at 1.40c., f.o.b. mill, Pittsburgh district, but in some cases the mills absorb part of the freight at competitive points.

Plates.—The steel car market is practically dead, as there has not been an order worthy of note placed in the last month. It is probable that the Woods Run plant of the Pressed Steel Car Company will be closed down in a month or so, owing to lack of orders, but its McKees Rocks plant is fairly well filled for the remainder of this year. This plant turns out from 60 to 65 steel cars per day. All plate mills are badly in need of work, and there is no trouble whatever in getting prompt shipments. There is some idle capacity among the plate mills, and this will soon be increased unless the demand shows early betterment. We quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, while three or four plate mills in the Pittsburgh district, that make a limited range of sizes, are quoting about 1.35c., at mill.

Sheets.—The American Sheet & Tin Plate Company continues to operate its sheet mills to about 81 per cent. of capacity, but has made no official announcement as yet of the starting up of its Aetna-Standard Works at Bridgeport, Ohio, which contains 23 hot mills. Prices on sheets do not show any betterment, and it is said that some of the mills that buy bars in the open market are selling their product at about cost or lower. Nearly all the mills will accept orders at present prices for delivery over the remainder of this year, but will not book orders into next year at such figures. Box annealed, one pass cold rolled black sheets, No. 28 gauge, are on the basis of about 2.15c. to 2.20c., and No. 28 galvanized at about 3.20c. to 3.25c. at maker's mill in carload and larger lots. Painted and galvanized corrugated sheets are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets will be found on a previous page.

Tin Plate.—Conditions in the tin plate trade continue active, all the leading mills having their output booked up for the remainder of this year and into the first quarter of next. All that is needed to keep up this activity is for the canning and packing interests to specify on their contracts, which they are doing quite freely. The Laughlin and La Belle tin mills of the American Sheet & Tin Plate Company are still shut down, and no announcement has been made when they will resume. Prices are firm, and it is said that

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in some cases premiums of 5c. to 10c. per box are asked by mills on new orders calling for prompt shipment. We quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—The implement and wagon builders are specifying at a fairly liberal rate on their contracts for soft steel bars, while new orders and specifications for hard steel bars for concrete reinforcement are coming in very satisfactorily. The railroads are not doing much new buying in either iron or steel bars, limiting their purchases to small lots to cover current needs. All the mills rolling iron bars are in need of more orders and specifications are only fair. Several conferences have been held in the past week between representatives of the bar iron mills and the Sons of Vulcan. The Amalgamated scale is based on $6.12½ for boiling, but the Sons of Vulcan puddlers want a rate 50c. higher. Another conference was held Tuesday in this city. We quote steel bars at 1.40c. to 1.45c. and common iron bars at about 1.45c., Pittsburgh.

Spelter.—There is a good inquiry, and prices are firm and slightly higher. We quote prime grades of Western at 5.30c., East St. Louis, or 5.32½c., Pittsburgh.

Hoops and Bands.—The demand is confined to small lots to cover actual needs. Specifications against contracts are being received by the mills at only a fairly satisfactory rate. We quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card of September 1, 1909.

Spikes.—Not much new track laying is under way at present, and the character of the orders being placed for railroad spikes clearly shows that they are to be used in repair work. The demand for small railroad and boat spikes is better than for standard railroad spikes, but all the makers are short of work. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—Only small lots are being bought. Regular prices, which are 1.90c. for structural rivets and 2c. for boiler rivets, continue to be more or less shaded.

Shafting.—Specifications on shafting from the automobile trade, and in fact from nearly all consumers, have fallen off very much, and all the makers of shafting could handle more business. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The new demand is only fair, being mostly for small lots to cover current needs. Specifications are not coming in at as liberal a rate as expected at this season. The demand for cut nails is light. The La Belle Iron Works, Steubenville, Ohio, which operates a large cut nail mill at Wheeling, W. Va., has turned out 194,682 kegs in the year ending June 30, 1910, against 187,722 kegs in the previous year. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—The pipe trade continues in fairly satisfactory condition, orders being about as heavy as expected at this usually dull season. A great many jobbers and consumers specify prompt shipments in sending in new orders, and this is taken to indicate that stocks are pretty well depleted. The large trade is placing orders for pipe only in sufficient quantities to keep up stock and not anticipating the future, even though a guarantee in prices against decline has existed for some time. No large inquiries for line pipe are in the market, but some very large jobs are on the tapis that will not be out until next year. On the larger sizes of pipe the mills are pretty comfortably filled for some time, but in the butt weld sizes conditions are not so good. It is stated that regular discounts on iron and steel pipe printed on a previous page are being pretty well maintained.

Boiler Tubes.—The demand is slow, being confined mostly to small lots, while prices on steel tubes are pretty badly demoralized. On iron tubes the market is fairly well maintained, but all the mills rolling both merchant and locomotive tubes are badly in need of orders.

Coke.—The coke trade shows no betterment either in demand or prices. Operators continue to restrict output. The Upper and Lower Connellsville regions last week produced 342,775 net tons, against 361,913 tons in the previous week. Shipments are about 10,000 cars per week, but a good deal of coke is piled. An Eastern furnace interest closed last week for its supply of coke for the remainder of this year on a sliding scale, based on the average monthly price of basic pig iron. Another furnace interest has purchased a fairly large tonnage for shipment in September at $1.60 per net ton, at oven, making upward of 20,000 tons it has bought for shipment this month. No large inquiries are now in the market. We quote standard makes of furnace coke at $1.60 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $1.80 on contracts for delivery over the remainder of this year. Prompt 72-hour foundry coke is about $2.10 to $2.25 per net ton, at oven, and on contracts from $2.25 to $2.50, at oven. Some grades of both furnace and foundry coke that do not run high in quality are offered at lower prices. The coke regions have had some heavy rains in the past 10 days, and these helped out many plants that were running quite short of water.

Iron and Steel Scrap.—The scrap trade is showing more life than for some time. Consumers have some inquiries out and are more frequently buying, while prices have shown an advance. The scrap lists of the Pennsylvania Lines West closed last Friday, and it is said that the heavy steel scrap offered brought $14.75 or better at the consuming point. The scrap lists of the Pennsylvania Railroad Lines East, the Norfolk & Western and several of the Southern roads closed Tuesday. Two leading consumers have been fairly large buyers of heavy steel scrap and bundled sheet scrap and borings and turnings. We note a particularly active demand for bundled sheet scrap, and several sheet and tin mills in the Pittsburgh district have sold their output in the past week for the remainder of this year. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.75 to 13.00
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, September 14, 1910.—(*By Telegraph.*)

The coal mines of Illinois resumed operations Monday and a serious disturbance to business in the West has been settled. The cost of coal to manufacturers who buy on regular contracts will be increased about 10 per cent. by the concessions granted the miners and other conditions affecting the market, but the price in the open market is likely to be higher. Railroad stocks of fuel have been reduced to nominal proportions, and some of the roads announce that they will not accept commercial shipments until they have restored their own reserve stocks. The demand from railroads, industries and the distributers of domestic coal will soon create a shortage of cars, and an early winter may bring a scarcity of fuel in the West. The iron and steel market has quieted down again after the flurry of anticipation two weeks ago. The curious condition which prevailed last summer is becoming even more pronounced. The demand is very good for all the lighter products that go into general consumption, but there is little new business in the heavier forms of finished products which go into construction or railroad work. In the hardware trade, for example, the jobbers in Western cities are doing more business than a year ago, although conditions were then very satisfactory. The wire interests share in this movement of the hardware trade and the demand for wire products is better than in August. In the case of merchant steel the shipments into this territory during August broke all records, both in tonnage and value, running in excess of August, 1907. The demand for sheets is keeping up at a good rate, and specifications for soft steel bars also reflect a strong tone in the market. In plates, structural shapes and railroad material conditions remain unsatisfactory, and this is also true wherever the closing of business depends upon the sale of bonds or mortgages. The scrap market has settled down again, disappointing the dealers who expected a more active demand. The movement of scrap, however, is expected to be restricted somewhat this fall by conditions in the coal trade, which will create a shortage of cars for loading scrap. Complaints are also growing more general of a shortage in box cars.

Pig Iron.—The Western market has settled down into another waiting period. Buyers are generally covered for their requirements to the end of the year and are only interested in the question of purchasing for the first quarter or first half, while the furnaces generally refuse to sell for next year excepting at an advance in price which the buyers consider prohibitory. The local furnaces are selling freely for last quarter and are booking quite a run of orders from

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carloads to 500 tons. In the aggregate, the weekly sales of Northern iron are probably in excess of current production. The stocks which accumulated at furnaces in this district during the summer begin to show a slight decrease. The furnace interests, however, are very firm in their policy of refusing to sell for next year's delivery. The Southern furnaces, with a few exceptions, are also refusing to sell for next year. Buyers in this territory seem to have all the Southern iron they want for last quarter and the trade is therefore very quiet. In a few cases sales for first quarter have been made at $11.50, Birmingham, and one or two well-known brands are offered at $12, but no effort is being made by the furnace interests to close forward business. Old observers of the iron trade in this territory say they have never known a time when buyers were so generally covered for a definite period ahead, with all contract business ending so abruptly at a future date, as in the present case, when practically all pending contracts terminate with December deliveries. This situation creates a strong undertone in the market and the furnace interests are confident of getting better prices for next year, but the buyers meantime are awaiting developments. The following quotations are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—The market is quiet with only occasional inquiries. The price of forging billets remains unchanged at $29, base, Chicago, for current lots.

Rails and Track Supplies.—The market is very quiet with only a few inquiries pending for standard rails. The railroads, however, have taken the full tonnage which they ordered for 1910 shipment. In a few instances deliveries were held back for a time, but shipping orders were eventually given. The demand for track supplies is falling off somewhat. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Merchant Steel.—One of the leading mills advises that its shipments of merchant and agricultural steel into this territory during the month of August were larger than in the same month of any previous year, both in tonnage and value. August of this year compares very favorably with other large months in the record of this branch of the steel industry. The best record for August in any previous year was in 1907, but the figures for that year were surpassed in 1910.

Cast Iron Pipe.—The leading pipe foundry interest was the successful bidder last week for 800 tons of water pipe at Pella, Iowa. No other important lettings are reported and a quiet market is expected for some time. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Bars.—There have been very good inquiries the past week for concrete bars, on which the trade had been dull for several weeks previous. Soft steel bars are quiet, but the mills are getting full specifications on their yearly contracts. There is not much improvement in the demand for bar iron. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Sheets.—The demand for annealed and light sheets is keeping up at a very satisfactory rate, in view of the dullness in heavier lines of products. Prices are practically unchanged. The local mill has no difficulty in keeping its 18 mills in operation, owing to the general demand from the jobbing and manufacturing trade for open hearth sheets. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Plates.—The market is quiet, awaiting news from the car building industry. The larger mills represented in this market are holding 1.40c., Pittsburgh, as the minimum, but on certain narrow sizes 1.35c., Pittsburgh, or 1.53c., Chicago, can be done. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Structural Material.—A fair amount of work is coming forward from the West in view of the unusual conditions which are holding back large enterprises. The Chicago, Burlington & Quincy Railroad has ordered 700 tons of bridge work from the American Bridge Company, this being in addition to the order for 1000 tons given to the same interest a couple of weeks ago. A power house for the North Shore Electric Company, Chicago, 405 tons, was let to George W. Jackson, Inc. A bridge for the Chicago & Northwestern over the Wisconsin River, 1620 tons, went to the American Bridge Company. The Hoffman-Meyer Building, Los Angeles, Cal., 300 tons, was taken by the Western Boiler Works of that city. The John Swett School, San Francisco, 210 tons, was let to the Brode Iron Works of that city. Reports have not been received here as yet regarding important work at Seattle which should have been let by this time. The demand for plain material from mills is running light at present, but there are no reports of concessions in prices. There are several inquiries from car builders for small lots of car shapes. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c., to 1.90c., Chicago.

Wire Products.—Hardware jobbers throughout the West report that their general trade is running from 10 to 40 per cent. ahead of last year. The wire trade shares in this activity and orders received by the mills during September have been running ahead of August, although the August record of the leading interest was only exceeded once in the same month of any previous year. New business from industrial buyers of wire is also improving. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Old Material.—The scrap market has relaxed somewhat without any actual changes in prices. For a time many of the dealers expected a higher market and were disposed to advance their prices, but consumers did not show any haste to purchase, and values have remained practically unchanged. There is a good demand for cast scrap, and it would seem that the gray iron foundries are either more active or wish to accumulate stocks of scrap before winter. The movement of old material is likely to be light during the next two or three months in the territory west of Chicago, especially in the grades of material which are shipped in open cars. Now that the Illinois coal mines have resumed operations the railroads will be compelled to keep in the coal service all their gondola cars, in order to guard against the political consequence of a coal famine in the West. This will curtail very seriously the supply of cars available for loading scrap. This situation, however, will not necessarily mean any shortage of scrap or famine prices. The iron and steel mills, which are the largest consumers of old material, have stocks that would carry them through the winter, and the foundries also have generally taken advantage of low prices this summer to accumulate stocks. The Atchison, Topeka & Santa Fe, which has not sold any scrap for several months, has a list closing this week of about 6000 tons. Included in this is 1800 tons of wrought scrap and 875 tons of malleable. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

THE IRON AND METAL MARKETS

Philadelphia

PHILADELPHIA, PA., September 13, 1910.

There has been more movement in pig iron, the cast iron pipe interests being the most important buyers. A betterment is also to be noted in purchases by the general foundry trade. Inquiry also seems to be more pronounced, both for the remainder of this year as well as early next year shipment, but aside from sales which have been made on a sliding scale basis, no business for next year has been transacted. Prices as a rule are unchanged, but are more firmly maintained. In finished materials market conditions show no particular betterment. The demand is still irregular, but the disposition is to maintain firmly the present range of prices. In most classes of rolled products business is of a hand to mouth character, although in plates and shapes a somewhat better volume is in sight. Billets are dull; buyers of large lots are apparently not ready to enter the market freely. Refined iron bars are a trifle more active. Several pretty good orders for skelp have been taken by Eastern rolling mills, which are now a trifle more actively engaged. A better undertone is to be noted in the old material market, while coke continues quiet.

Iron Ore.—The market is practically at a standstill. Consumers have already purchased more than can be used this year, at the present rate of consumption, and find it very difficult to store the ore coming in. During the first six days of September importations at this port aggregated 35,732 tons, valued at $106,545, while Government statistics for August show the total importations in that month to have been 147,166 tons, at a value of $444,252.

Pig Iron.—The most important transaction during the week was the closing of a contract for 18,000 tons of Alabama iron by a Delaware River cast iron pipe foundry. This includes Nos. 3 and 4 and gray forge grades, and delivery extends over six months, beginning October 1, settlement based on a sliding scale. This was virtually the renewal of a similar contract expiring at the close of September. One pipe interest will probably take on about 8000 tons of low grade iron for this year's delivery, while another has an inquiry out for 5000 tons for November-December shipment. A Virginia pipe maker is also asking for 6000 tons for early 1911 shipment. Sales of odd lots of low grade iron, both Northern and Southern makes, are also reported, but when any tonnage is involved sellers are inclined to hold prices rather firmly. A better volume of business has been transacted in the higher foundry grades; sales in small lots predominate, but quite a few transactions, covering lots of 300 to 700 tons, for this year's delivery are reported, mostly in No. 2 plain. No further shading of prices is reported and $16, delivered in this territory, appears to be the minimum for standard brands of No. 2 X, with a 25c. differential for No. 2 plain. In a few cases $16.25, delivered, has been done for No. 2 X, but the bulk of the sales are at the inside figure. Sellers contend that no further concessions will be made, and in many instances, rather than take on tonnage at the present basis, they would suspend production. The aggregate movement in Virginia foundry grades has not been large and stocks are understood to be increasing. Prices, however, are being well maintained at $13.25 to $13.50, furnace, equal to $16 to $16.50, delivered in this vicinity, dependent on delivery points. Better buying of forge iron by puddling mills is reported. Sales of several lots of 500 and 200 tons have been made at prices ranging from $14.75 to $15, delivered in this vicinity. No further purchases of basic iron are reported; the larger consumers are pretty well covered for this year's requirements, but several of the smaller mills are feeling around for lots of about 2000 tons for last quarter delivery. While the ruling question of $15 was slightly shaded in the transactions named last week, sellers will not make any concessions from that price for further business. One buyer is in the market for 2000 tons for first quarter of next year, but no business has been done. Further sales of standard low phosphorus have been made in small lots at prices equal to $22.50, delivered here. A sale of 500 tons of this grade, of a less desirable analysis, has, it is said, been made at a lower price. The general range of prices for standard brands, delivered in buyers' yards in this vicinity, shipment extending over the remainder of the year, is as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—No fresh demand has come out in this territory. Sellers report a small inquiry from the West, together with one for several hundred tons, for shipment over the next six months. Quotations are nominal, at $39 to $40, Baltimore.

Billets.—The situation shows no change. Usual large buyers continue to place orders for small lots for prompt delivery, which, together with specifications on old orders, keep mills operating on a fairly even basis. More demand for forging than for rolling billets continues to be noted. Prices are unchanged. Standard basic open hearth rolling billets are firm, at $27, delivered, as a minimum, with forging billets strong at $29, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—Business is still quite irregular although, on the average, mills get enough tonnage to enable them to maintain an even productive basis. A few more sizable orders have been placed, principally in boat plates, one order closed running up to 700 tons. Some additional bridge business for railroads, one in the South requiring a considerable tonnage of plates, is being figured on. Some mills have entered a few contracts for requirements over the remainder of the year, but there is no disposition to sell for next year's delivery. Prices are better maintained and we can learn of no shading of the 1.55c. basis for ordinary plates, delivered in this territory.

Structural Material.—Proposals for a bridge in the South requiring, probably, 10,000 tons of structural material, are expected to be opened in the near future. A number of moderate building propositions in this territory are pending, but close slowly. It is stated that the Philadelphia & Reading Railway will require about 2000 tons for bridge work, believed to apply on grade elimination work in this city. Current business is largely of a miscellaneous character, and prices of plain shapes are firm, at 1.55c., minimum, delivered in this vicinity.

Sheets.—Business is still confined to orders for small lots for comparatively early delivery, and, while mills gather enough to keep them engaged on a fairly active basis, a very small proportion of the orders on hand are for forward delivery. Quotations of Eastern manufacturers for ordinary business for prompt shipment range as follows, although concessions for desirable orders are still understood to be available: Nos. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—A better demand is noted, and sales of quite a few moderate lots, running up to 100 tons, are reported. With the improved inquiry comes a tendency toward firmer prices, and makers who were willing to shade 1.40c., delivered, for refined iron bars, now hold that price as the minimum. Steel bars have not been particularly active, but are firm at 1.55c. to 1.60c., delivered in this district.

Coke.—The movement has been light and confined principally to transactions in small lots of foundry coke, for which prices, while not higher, have been decidedly firmer, little standard grade being available at $2.25 per net ton at oven. Small sales of prompt furnace coke at $1.60 at oven, are reported, but no large sales for forward delivery are noted. The following range of prices per net ton, delivered in buyers' yards in this territory, is quoted:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—A better undertone prevails in the old material market. Occasional transactions in heavy melting steel are reported, but buyers find it very difficult to get any quantity of strictly No. 1 grade at $13.75, delivered, and in one instance $14 has been offered, but sellers, believing mills to be short, are not letting go. The bulk of the material now going to the mills applies on old orders. Rolling mills also find it difficult to get wrought scrap at the price offered, and in instances $16.25, delivered, has been paid for choice No. 1 railroad wrought. Prices, while unchanged, have a stronger tendency. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

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Cincinnati

CINCINNATI, OHIO, September 14, 1910.—(*By Telegraph.*)

Pig Iron.—An inquiry for 25,000 to 30,000 tons of basic iron from a nearby Ohio consumer is occupying the attention of the trade this week. This is supplemented by a number of requests for prices on smaller tonnages of foundry iron. The foundries in this vicinity are not so well stocked up as was generally supposed, and many small purchases to fill immediate requirements are being made. The two Michigan pump manufacturers who have been in the market for about 500 tons each are understood to be still on the waiting list. Several other moderate sized inquiries are also being held up, but the aggregate amount of carload business booked is very encouraging. Inquiries coming in also help to make the situation somewhat brighter. Southern furnaces are yet holding off on prices for next year. For the remainder of this year we quote $11.50, Birmingham, although some Tennessee irons are obtainable at $11. In the Hanging Rock district $14.50 for the last quarter can be done. While $15 to $15.50 is asked for the first quarter of next year, it is understood that the lower figure might be shaded. Very little malleable has been sold lately, and $14.50 to $14.75 covers the market price. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 15.70
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—With the exception of an inquiry from a Southern furnace there is nothing interesting in the coke situation. This contract would call for about 8000 tons per month, and it is expected to be closed before the end of the month. It is reported that some Wise County furnace coke is yet obtainable for prompt shipment around $1.50 per net ton at oven, and in the Connellsville district a considerable quantity is stated to be loaded on cars and the same figure would probably be acceptable to get this moved. The Pocahontas field shows no changes and $1.75 at oven is understood to be the prevailing contract price. Connellsville and Wise County furnace brands range all the way from $1.70 to $1.80 per net ton at oven for future shipment. Contract foundry coke is moving freely, but only small lots are now being bought. The price for all three fields is around $2 to $2.10, at oven, with a small advance for special brands.

Finished Iron and Steel.—On steel bars and plates both the mill and warehouse demand has been good. Structural material from warehouse also shows some improvement. The mill price is 1.40c. for bars and plates and 1.80c. from local warehouses. Beams and channels, cut to length, are quoted at 1.90c. to 2c., warehouse.

Old Material.—The railroads have large quantities of scrap to offer, but are not willing to accept buyers' bids. Not much improvement is looked for until late in the fall. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Matthew Addy & Co. have been appointed sales agents for this territory for the Southern Iron & Steel Company.

St. Louis

ST. LOUIS, September 12, 1910.

Since the month came in there has been with many foundrymen a marked improvement in the demand for their finished products, according to the reports of returning traveling salesmen. Locally, also, from numerous companies both large and small, similar indications of better conditions in the iron industry are mentioned. A feature of the pig iron trade is numerous inquiries mainly for first half 1911; also a firming up on prices. Shipments on contract are uneven, some concerns asking for postponement and others wishing contract time anticipated. Collections are not as prompt among small buyers as should be the case. Business is on the increase from country merchants, and St. Louis postal receipts in August show a gain of over 13 per cent. over the figures of the corresponding month last year.

Coke.—With the exception of one round lot the inquiry for coke during the past week was moderate in volume and sales mainly confined to small lots. A leading sales agency reports an inquiry for 25,000 tons, Connellsville foundry. Another office mentions sale of 10 carloads foundry coke, shipment over the remainder of the year. The market is hardly as strong as of late, though no material change in price is noted. There was a large tonnage placed during July and August, and doubtless most of the big buyers have covered for wants. No contracts are being taken to extend beyond July 1, 1911. It is freely predicted that later on there will be a severe car shortage and some buyers are now disposed to lay in coke. We quote standard brands of 72-hr. Connellsville foundry at $2.25 to $2.50 per net ton and furnace coke $1.85, f.o.b. oven.

Pig Iron.—There is renewed inquiry for malleable iron. The sale of 5000 tons over first half 1911 is reported, divided between two offices and going to two local foundries. There is also an inquiry pending for 5000 tons additional. With most brokers, the sale of Southern foundry was confined to moderate lots, one office reporting only 350 tons booked, another 600 tons, while a merchant seller placed a contract for 1000 tons gray forge iron, shipment over February, March and April, 1911. Among the inquiries reported were the following: From an implement concern 500 tons Southern foundry, shipment over the last quarter; from an Illinois company 500 tons Southern foundry, immediate shipment; 250 tons 12 per cent. silicon, remainder of year; another broker mentions 400 tons 80 per cent. ferromanganese; 800 tons low phosphorus iron over the remainder of the year; 600 tons No. 3 Southtrn foundry, shipment over the first half 1911. For small lots, ranging from 100 to 200 tons, the various offices reported in the aggregate inquiries covering 1500 tons—doubtless duplicated to some extent. It is evident there is an increased interest in the market and some foundrymen note a marked improvement in their business since September 1. The tone of the market, too, is firmer and offerings of $11, Birmingham, for No. 2 Southern foundry are becoming scarce. It is likely there was some business worked that has not been reported that has taken most of the low priced iron off the market. Short selling also is entirely eliminated. Very few furnaces are willing to name prices for 1911 iron, but it is understood some are quoting $11.50. For No. 2 Southern foundry, shipment over the remainder of the year, we quote $11.50, f.o.b. Birmingham; southern Ohio, $15, f.o.b. furnace.

Old Material.—In scrap iron and steel the market is featureless. A very small demand is coming from consumers and even among dealers little is doing. Stocks are moderate in volume and, being in strong hands, there is no disposition to force sales, but await the development of the demand which ere long is expected to set in. There were no railroad offerings the past week. Prices on some items in the list are lower. We quote dealers' prices as follows, per ton, f. o. b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$12.50 to $12.75
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

The company succeeding to the business of the C. A. Stevenson Pig Iron & Coke Company has been organized and the style is now Massot, Romann & Bush, with offices in the Fullerton Building.

The settlement of the Illinois miners' strike is a matter of relief to coal users in this section, the shortage in production to date being 20,000,000 tons. The average increase per ton is 3 cents.

The Baltimore & Ohio Southwestern is contemplating

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large improvements, which will include an extension of terminal facilities at East St. Louis, covering enlargement of terminals and the laying of much additional trackage. Similar improvements will be made in its terminals at Flora, Ill., and Seymour, Ind.

University City has recently equipped its fire department with an automobile fire engine and ladder truck, at a cost of upward of $9000. Tests made with the apparatus were very satisfactory.

Birmingham

BIRMINGHAM, ALA., September 12, 1910.

Pig Iron.—A lot of 18,000 tons of low grade iron for shipment during the next four months has just been sold in this market. In addition, the sale of 2300 tons of low grade iron for last quarter shipment and 500 tons of No. 4 foundry for October delivery is reported. An aggregate of 2500 to 3000 tons for shipment extending over the next 60 to 90 days represents transactions involving from 100 to 500 tons each, and that sold for spot shipment is between 1200 and 1500 tons. The prices received the past week are about in line with those of the week previous. It is probable that a strictly $11.50, Birmingham basis, has not been maintained in all these transactions, but there is no reason to believe that material concessions were made in any case, and sellers are apparently well satisfied with the present status of order books. The market is generally understood to be correctly represented by the $11.50, Birmingham basis, for deliveries up to January 1, but without commitments on the part of sellers in the matter of price for shipments after that time. A leading interest refuses to submit quotations on first quarter deliveries, and such figures as have been elicited from other large concerns are understood to have been prohibitive. The latest stock reports show that the aggregate accumulation in this State, which includes warrant holdings, was reduced some 60,000 tons during the month of August. In some cases furnace yards have been practically depleted of all grades and in others high grades are promised for December shipment only. The additions that are about to be made to the active furnace capacity are necessitated by the scarcity of certain grades for orders already booked and will not add to the surplus stock. It is noted that even as small lots as carloads of favorite brands of No. 2 soft iron recently brought $12, Birmingham, for spot shipment, owing to the inability of purchasers to receive shipments against regular contracts.

Cast Iron Pipe.—No developments of importance have come to the surface in this market the past week and transactions are in the main with small municipalities who demand at this time a fairly attractive tonnage for maintenance work and extensions. Producers generally are more optimistic and have higher prices in mind, although no change has so far been made in authorized quotations and an accurate test of the market's strength is not offered. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12 in. average $20.50 per ton, with $1 per ton extra for gas pipe.

Old Material.—There is a somewhat stronger demand for light cast, and the movement of wrought and steel scrap is more satisfactory. The actual consupmtion of any grade has increased but little and report is made of large stocks in consumers' hands. However, dealers' yards have been kept cleaned of surplus stocks and there is no reason to expect an effort to make a market. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

San Francisco

SAN FRANCISCO, September 7, 1910.

The holidays and festivities in San Francisco this week tend to intensify the dullness in the iron and steel market. Buying is still limited to small orders covering the most pressing requirements, but a change is expected shortly. Local conditions are favorable for an increase of activity in some departments, structural material in particular showing signs of a revival. A general movement of finished materials to the interior is usually expected during September, and as orders from that quarter have been limited for some time the demand is likely to be unusually heavy. While the distributive trade has not improved, it is believed from the nature of inquiries now coming up that some substantial orders will shortly be booked by rolling interests. The uncertainty of the local industrial situation may limit the volume of business in San Francisco, but Los Angeles manufacturers are now working on about a normal scale and the growth of industries at Stockton and Sacramento will materially increase the requirements at those points.

Bars.—The mill representatives are receiving liberal specifications for soft steel bars on old contracts. While the larger buyers have not yet commenced to place new orders to any considerable extent, some good inquiries are coming into the market and a fair tonnage will probably be booked before the end of the month. Local merchants are limiting their purchases rather closely, as the stocks now on hand have lasted longer than was anticipated. The demand for twisted and corrugated reinforcing bars is well sustained, the movement being slightly larger than a month ago, though most orders in this line are for comparatively small lots for immediate delivery. A large volume of concrete construction work is coming out all along the Coast, for which purchases will be made during the next few months. The city of Los Angeles has purchased a large tonnage of reinforcing bars and fabric during the Summer and continues in the market. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—The San Francisco building record for August shows a slight increase over the preceding month, but is far below that of a year ago. In other California cities building continues fairly active, though the greatest activity is noted in the North, August being one of the best months ever recorded in Portland, Ore. A very fair tonnage has been booked recently by structural fabricators, including contracts for several large buildings, though the majority of recent bookings in San Francisco have been small. A better feeling prevails among local fabricators, who have had a very quiet summer, but are now fairly busy on small work and have a number of good jobs in view. There are indications of a very heavy tonnage all along the Coast, but especially in the North, where inquiries are coming out on a number of large structures. The Pacific Rolling Mill Company's local shop is well occupied with local work and has in addition two contracts at San Diego and one at Pomona, Cal. The Brode Iron Works has taken about 120 tons for the John Swett school, and the Meyer & Hoffman Building at Los Angeles, about 200 tons, has been let to the Western Boiler Works of that city. An award on the Native Sons' Hall is expected at the end of the week, and the Capwell Building contract in Oakland will come out about the same time. Bids have been submitted on the Eagles' Hall, and the contract will be let hbout September 20. The Masonic Temple contract is also expected shortly. A considerable tonnage is being booked for small steel bridges in various parts of the country. Contracts are to be let within 60 days for three new high schools in San Francisco, all of which will be of steel. Plans have been completed for a building for the London, Liverpool & Globe Insurance Company at California and Liedesdorff streets. It is reported that work will be started about the first of the year on a large Federal building in Alameda, Cal. Plans have been accepted for a steel-frame building in San Francisco for the Knights of Columbus. Plans have been completed for a $500,000 station for the Southern Pacific at Sacramento, Cal. The Rincon Warehouse Company has secured a loan for the erection of a large five-story building on Brannan street. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—Light rails remain inactive, but a fair tonnage of standard sections is being booked in the North, and a number of new inquiries for moderate amounts are coming out in California. The Board of Public Works has approved the specifications for rails for the new Gary street line, and an appropriation of $130,000 has been asked to pay for the material. Specifications are also about completed for poles and other material for this road. The Oakland Traction Company is making some minor extensions to its lines and the Peninsular Railroad has been in the market for a considerable tonnage. Harriman officials have organized a company to construct a 70-mile road from Grant's Pass, Ore., to Crescent City, Cal.

Plates.—The movement is not yet especially active, but a slight improvement is noted, and there is sufficient inquiry to arouse hopes of a large business next month. Tank plates and material for riveted pipe are the leading features, all fabricators in this line being extremely busy. The Consolidated Gas Company, Long Beach, Cal., has ordered a large gas holder. The Union Oil Company is planning a large plant at Tacoma, Wash., and the Standard Oil Company will erect two large tanks at Klamath Falls, Ore.

Merchant Pipe.—The outlook is a little brighter than for some time, though the volume of business actually in hand is still limited. The jobbing movement has not improved to any appreciable extent, but inquiries from the outside trade are becoming more numerous, and a fair demand is likely to materialize within the next three weeks.

THE IRON AND METAL MARKETS

Most of the local jobbers are inclined to hold off from the market for the present, as stocks are ample for immediate requirements. Business is still very slow in the oil fields and while a number of new projects in that district are talked of it is not expected that much business will develop this season. Pipe and fittings are being purchased for a number of water systems, &c., but these orders are not of much importance. Pipe line privileges on the San Francisco water front have been secured by a number of corporations.

Cast Iron Pipe.—Bookings have been comparatively light so far this month, being mostly confined to small orders, though some fairly important business is in prospect. Bids are being taken by the city of San Francisco for another lot of pipe for the auxiliary fire protection system. The outlook is favorable in the North, where plans are taking shape for a number of extensions to municipal water systems.

Pig Iron.—The amount of work in progress at the local foundries is extremely small, as under existing labor conditions San Francisco concerns are unable to compete with those more favorably located on most classes of work. Operations at Los Angeles are also somewhat hampered by labor conditions and there is very little demand for pig iron at either place. Supplies in the hands of melters are adequate for all immediate needs, and importers find it difficult to dispose of any large lots, either from warehouse or to arrive. There is a fair movement to the interior, as several good foundries have been established at Stockton and other points within the last few years and are now in active operation. In the absence of large marine and mining machinery business, however, the requirements of the California market are much smaller than a few years ago. Values show little change, being approximately as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $25.

Old Material.—The only notable feature is the arrival of 500 tons of mixed scrap from the Panama Canal, which was sold at auction by the Government at $7.55. All descriptions of scrap are extremely quiet. There is little demand for cast iron, but the market is closely cleaned up and the little stock that is coming out is firmly held. The price is still maintained on steel melting scrap, but there is a tendency to weakness in sympathy with the Eastern market. Railroad wrought is featureless, both supply and demand being small. There is no demand for rerolling rails locally, as operations of local mills have been curtailed, but there is no heavy accumulation. A better demand for old material is expected on the Coast within the next few months, in view of the establishment of several new steel manufacturing plants. Prices are quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

Buffalo

BUFFALO, N. Y., September 13, 1910.

Pig Iron.—Inquiry is increasing for first quarter and first half of 1911. A radiator concern having a number of plants is in the market for between 40,000 and 50,000 tons of foundry irons for 1911, but no placements have yet been made on this account. Another consumer is asking for 6000 tons foundry grades for first half delivery. Several other consumers also have inquiries out for 1911 deliveries, but only a small tonnage has been placed. The bulk of the business taken during the week has been for current quarter delivery. Most furnace interests are backward about taking on much 1911 business under present conditions and no very large business has been actually closed. Quotations made by the majority of furnacemen are 50c. to $1 above current schedules, depending upon the period of delivery required. The demand for present quarter delivery in foundry grades is good and a number of orders of fair tonnage for such deliveries have been entered during the week, ranging from 100 to 500 tons, with two or three of 1000 tons each. Basic is dull, but little inquiry having developed during the week. Prices for short term deliveries are nominally unchanged, but manifest a stiffening tendency as compared with the past week or so, the result of additional furnaces going out of blast, and it is extremely doubtful if the very low prices which were until recently obtainable could now be duplicated even for large tonnages. We quote as follows, f.o.b. Buffalo, for current quarter deliveries:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Pig iron shipments via the Erie Canal have been interfered with during the past two or three weeks, owing to a break near Mohawk, which tied up the entire tonnage of the canal and has but recently been repaired, and are also restricted by the grain movement, which is exceptionally heavy at the present time.

Finished Iron and Steel.—The situation remains practically the same as last week, with a fairly active market in all finished lines, and some agencies report an increased demand for steel bars and plates, and there is a good inquiry for sheets. For steel bars 1.40c., Pittsburgh, is still being quoted on desirable specifications and 1.45c. for small lots. In plates and shapes 1.40c., Pittsburgh, is ruling for desirable orders for immediate shipment and 1.45c. for small lots. The Canadian export trade is showing great activity, one interest having inquiries pending for over 10,000 tons of finished products, including bars, plates and structural material. In fabricated structural material the local market is a little slower, there being fewer new projects coming up for bids than for several weeks. Bids went in last week for a bridge for the Buffalo & Lake Erie Traction Company, to be erected between Northeast and Ripley, Pa., requiring 600 tons of steel, delivery to be made in November. It is stated that the bids for the new Utica Hotel, Utica, N. Y., were so much higher than estimates that modified plans will be drawn and new bids asked for. The Isawanna Building Company, 200 Fifth avenue, New York City, was low bidder on the general contract and the Buffalo Structural Steel Company for the steel, the original specifications calling for 1230 tons.

Old Material.—The week has shown no particular improvement. Quiet conditions continue, with a limited demand. Dealers are inclined to hold material in preference to letting it go at prices at present obtainable. We quote nominal prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.50 to 15.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.25
Clean cast borings	5.75 to 6.25
No. 1 busheling scrap	11.25 to 12.00

Cleveland

CLEVELAND, OHIO, September 13, 1910.

Iron Ore.—With orders pretty well filled, some of the ore properties in the Lake Superior district are being shut down and the output of others is being curtailed, so that a heavy falling off in the movement is expected the present month. While the total shipments until September 1 greatly exceeded those during the same period of last year, some of the ore men do not look for a larger movement this year than last. The lake movement during 1909 was slightly over 41,600,000 tons. Others predict that the total lake shipments this year will reach 44,000,000 tons. The 1909 movement broke former records, being slightly in excess of 1907. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—A fair volume of quiet buying is going on, and considerable inquiry is pending for small and medium sized lots of foundry iron, both Northern and Southern, mostly for the last quarter and first half deliveries. Many consumers are feeling the market, and if they could place it at current prices for first half deliveries a large tonnage would doubtless be booked. The majority of the furnace interests, however, are still holding off, and are declining to make quotations for delivery after January 1. Others are holding for prices for the first half at 50c. to 75c. a ton above current quotation of $14, Valley furnace, for No. 2 for the remainder of the year. The International Harvester Company, which had an inquiry out last week for 2000 tons of No. 2 foundry and 2000 tons of low grade iron for the last and first quarter, for its Akron, Ohio, plant, has placed the business at a price understood to be about $14 for No. 2, extending through the first quarter. There is an inquiry from a nearby stove foundry for 2000 tons of Northern and Southern for first half. Another 2000-ton inquiry is for low grade analysis iron for delivery to an Ohio pipe plant in November and December. A local manufacturing plant is in the market for 500 tons each of Northern and Southern for the last quarter, and there is an inquiry from the Toledo territory for 800 tons of No. 2 for the first half. There is an inquiry from New York for 500 tons of high phosphorus iron. We note the sale of two lots of high silicon for first half delivery, one of 700 tons and the other of 200 tons. For delivery after January 1 Jackson County silvery is being quoted at $18.50, at furnace, for 8 per cent. silicon. Some Southern iron is being offered at $11, Birmingham,

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for No. 2 for the remainder of the year and $11.50 for the first quarter, but the Alabama furnaces are generally asking $11.50 for the remainder of the year, and are declining to quote prices for delivery after January 1. For prompt shipment and for the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.00 to 14.15
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—The market is generally quiet. A few contracts are reported for foundry grades, but there is no demand for furnace coke. Prices remain stationary. We quote standard furnace coke at $1.60 to $1.70 per net ton at oven for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 per net ton at oven for spot shipment, and $2.25 to $2.50 for delivery extending through the first half.

Finished Iron and Steel.—The demand in finished lines continues generally quiet. Mill agencies report a fair volume of orders, but practically all are for small lots for immediate needs. The demand for steel bars is holding up quite well, but as consumers are about all under contract little new business is coming out. Prices are firm at 1.40c., Pittsburgh. The demand for plates is quiet. The leading mills are adhering to the base price of 1.40c., Pittsburgh, and are booking small orders at that price, apparently not being affected by lower quotations made by small mills that make only the narrow sizes. The demand for structural material continues good and 1.40c., Pittsburgh, is being firmly maintained. Local fabricating shops are filled up for some time and are placing frequent small orders with the mills to replenish stocks. The demand for sheets has improved slightly, but lower quotations are reported. Some contracts for the remainder of the year have been placed at current prices. We quote black sheets at 2.15c. to 2.20c. and galvanized at 3.15c. to 3.20c. for No. 28, and blue annealed at 1.60c. to 1.65c. for No. 10. The demand for iron bars remains light and quotations are unchanged at 1.35c. to 1.40c., at mill. There is a fair demand for rivets, but prices are weak, and the regular quotations of 1.90c. for structural and 2c. for boiler rivets are being shaded $2 a ton.

Old Material.—After a few days of a little more activity the market has apparently settled down to another period of dullness. There was some buying during the week, but only in small lots for immediate needs. Dealers report practically no inquiry from outside points. Prices remain fairly steady. No changes are made in quotations. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

C. H. Lewis & Co., dealers in pig iron and coke, on September 1 closed their Pittsburgh office at 944 Oliver Building. Their business in both the Cleveland and Pittsburgh territories will hereafter be conducted from their Cleveland office in the Rockefeller Building.

The German Iron Market

BERLIN, September 1, 1910.

The new organization of the pig iron trade has been duly constituted. It is in effect a syndicate, but calls itself an association. It has its own capital of 100,000 marks, and has a legal standing before the courts; in other words, it can make binding contracts to buy and sell iron and it can sue and be sued. The organization, however, has not yet assumed the dimensions that its backers hoped for. The negotiations with the Siegerland group have come to a standstill, and it is quite uncertain whether any arrangement whatever can be made with the furnaces there. To gain time for further negotiations with all outside interests the leaders of the new syndicate came to an understanding a week or two ago that neither side would take any contracts for iron for 1911 delivery before September 11; but a dispatch from Siegen of yesterday's date states that the furnaces there have begun to do business for 1911 at 59 to 61 marks for steel-making qualities.

The market has continued to show signs of improvement. Prices are firmly held and are partly tending higher. Consumers have evidently reached the conclusion that they will not gain anything by waiting longer for cheaper prices, and they have shown a greater willingness to place orders. From the Silesian district it is reported that orders in hand have increased in volume.

In semimanufactured steel business is progressing satisfactorily. It is understood that some of the works protested against the recent decision of the Steel Syndicate to leave prices unchanged for the next quarter's business; and there was also some discontent that the price of structural shapes were left unchanged. There has been some increase of orders in the latter on the part of dealers; the trade, however, is still feeling the effects of the big lockout in the building trades of last May and June. Mills running on heavy rails have not much work on hand, but business is much better in light rails and there is a good prospect for bigger orders. Grooved rails are in very active demand, both from home and foreign sources.

In heavy plates business continues good, despite the strike and lockout in the shipbuilding trade. It is reported that the Heavy Plates convention will grant an export drawback or bounty on foreign business to lighten the pressure on the home market. It will amount to 2 marks per ton. In medium qualities business is brisk and it is even more so in the thinner numbers. The foreign demand for the latter has increased, and prices have been lifted a little on foreign orders; the home demand is also better, but is still lighter than the requirements of the mills. There is a better demand for tin plates.

The reports from the Belgian trade are again better. A yesterday's Brussels dispatch stated that the export price of soft steel bars has just been raised 2 shillings the ton at Antwerp; bar iron, 1 shilling; thin sheets of all grades the same advance, and skelp 2 to 3 shillings. According to press reports the iron companies and foundries in France are planning an advance of prices.

New York

NEW YORK, September 14, 1910.

Pig Iron.—Leaving out the business coming from pipe foundries, or under consideration by them, the local pig iron market has had little to stir it in the past week. The possibility of additional curtailment of production in New Jersey and eastern Pennsylvania is discussed in view of the fact that furnaces are getting through with contracts at prices of six and nine months ago and now having nothing ahead except business yielding only cost or but little better. The soil pipe company which had bought 7500 tons up to one week ago has made further purchases, and an eastern Pennsylvania pipe foundry is in the market for 5000 tons of No. 3 and gray forge for shipment in November and December. Buying by Virginia pipe works is reported also. An electric machinery company has bought some high phosphorus iron, but the report that a large pump manufacturer was buying is unfounded, as is also the report of buying by New York State agricultural works. We continue quotations as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75.

Finished Iron and Steel.—In this territory the past week was not as good as its predecessor, but week by week fluctuations are never a true indication of conditions. It would probably, therefore, not be fair to say that the slight improvement noted in the last few weeks has not continued. However, all lines are still very quiet; most of all plates and least of all steel bars. Bar iron tonnage remains about the same as for the last month. Structural interests have their attention especially centered on the forthcoming New York City subway work. Bids on the main contracts will close September 20 for those on contractors' funds and September 27 for those on city money. It will be two months at least before definite inquiries are in the market for the steel required and perhaps longer. The tonnage is very uncertain, depending on what plan is adopted; but if built with municipal appropriation it is estimated that it will amount to 150,000 tons, while with private capital it may reach as much as 240,000 tons. Among the largest structural contracts recently closed are the Underwood Building, Church and Vesey streets, New York City, nearly 1100 tons, awarded the Hay Foundry & Iron Works; the Mirror candy factory, Hudson and Morton streets, New York City, 1300 tons, and an apartment house at Eighty-second street and West End avenue, 700 tons, both given to Ravitch Bros; the John Swett School, San Francisco, 200 tons, awarded the Brody Iron Works; a coaling station for the Lake Shore, 400 tons, awarded the Fort Pitt Iron Works; a transfer station for the Wells-

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Fargo Company on West Twenty-sixth street, New York City, 300 tons, taken by the Metropolitan Bridge Company, and a building for the Ford Motor Company, Long Island City, 350 tons, awarded the Bethlehem Steel Company. A decision on the Sloane warehouse is expected this week; the general contract has been given to Charles T. Wills. The Central Railroad of New Jersey is in the market for a bridge of 300 tons at Bayonne. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Steel Rails.—The Colorado mill has taken some business recently from roads naturally tributary to it. The bookings of the leading producer in the past week were about 6000 tons, of which the largest lot was 3000 tons, taken by the Texas Mexican Railway. Of foreign orders booked by the United States Steel Products Company the largest is 25,000 tons for Australia.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the lowest bidder on about 12,000 tons of 42-in. pipe at the letting at Portland, Maine, on Monday. The competition was keen and the prices submitted were all very low. The T. A. Gillespie Company, Pittsburgh, was the lowest bidder for the 6300 tons of 48-in. steel pipe. The contractors for the water works extension on Staten Island have purchased from the United States Cast Iron Pipe & Foundry Company the 5500 tons of cast iron pipe required. General business is still phenomenally light. Cast iron pipe manufacturers of very long experience characterize this autumn as the quietest they have ever known. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Old Material.—An eastern Pennsylvania steel company secured about 700 tons of Panama scrap sold here last week, for which $10.55 per gross ton was paid. The scrap was a mixed lot, including 70 tons of uncut boilers. The railroad lists this month are bringing slightly better prices than for some time. Heavy melting steel scrap is wanted, but most dealers are holding their stocks and thus a somewhat uncertain situation prevails with regard to prices. Offers of $12.50 per ton have been made and refused, while, on the other hand, the prices now being offered for delivery at steel works in eastern Pennsylvania will not admit of a higher New York price than $12. The higher offers have been made to secure material needed to apply on old contracts taken some months ago, but these contracts are not large and their influence is likely to be only temporary. The volume of business in cast scrap, some grades of wrought scrap, cast borings and a few other special lines has been somewhat larger than the previous week. The available supply of cast scrap seems to be limited. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Metal Market

NEW YORK, September 14, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Sept.	Lake.	Electrolytic	Tin.	New York.	St. Louis.	New York.	St. Louis.
8	12.87½	12.62½	35.60	4.40	4.30	5.40	5.25
9	12.87½	12.62½	35.50	4.40	4.30	5.40	5.25
10	12.87½	12.62½	....	4.40	4.30	5.45	5.30
12	12.87½	12.62½	35.70	4.40	4.30	5.45	5.30
13	12.87½	12.62½	35.10	4.40	4.30	5.50	5.35
14	12.87½	12.62½	34.80	4.40	4.30	5.50	5.35

Tin is lower this week and there is a good deal of trading going on. Copper is inactive and the tone of the market is somewhat weaker. Spelter is steadily advancing.

Copper.—Contrary to the expectations of many, the copper producers' report showed no decline in production, but nevertheless it was taken favorably. It is highly probable, however, that a decrease in production will be shown in the next report. There is so little buying going on that some outside sellers are reported to have offered electrolytic copper as low as 12.50c. The general prices of copper, however, are 12.62½c. for electrolytic and 12.87½c. for lake. These prices might be shaded by some holders of outside lots. At the close of the London market to-day spot copper was selling for £55 3s. 9d. and futures for £55 7s. 6d. Sales amounted to 500 tons of spot and 1000 tons of futures.

Pig Tin.—There has been more activity in the pig tin market during the past week as consumers have had to buy. The trading was quite brisk last Thursday and Friday, but most buyers asked for only small lots to tide them over during the existing high market. The London market was down £1 2s. 6d. on this morning's cable, which is equivalent to ¼c. in this market. This afternoon the New York market was quoted at 34.80c., and this was the lowest figure for the week. The London market closed to-day with spot tin selling at £158 and futures at £157 7s. 6d. The sales amounted to 250 tons of spot and 500 tons of futures. The market was weak.

Tin Plates.—Tin plates are selling fairly well, and there is a good call for foreign tin plates from the Standard Oil Company and other large interests who re-export the material in shipping goods abroad. The price for 100-lb. coke plates in New York is $3.84.

Lead.—There is only a fair demand for lead in the East, but there are reports of good sales in the West. Outside sellers are asking five points more in the New York market than the leading interest, whose quotation is continued at 4.40c. The St. Louis market continues relatively higher than New York and the quotation there is 4.30c.

Spelter.—Spelter continues to advance and 5.50c., New York, is now asked. This is a raise of ½c. over the price early in May, when it was announced that producers of spelter would refuse to sell for less than 5c. because they could not make any profit with the market at that price. Even at the present price of 5.50c. the producers show little anxiety to sell, and one consumer who tried to place an order at that price with two different manufacturers was turned down. He succeeded, however, in placing an order elsewhere. It is certain that there is a curtailment in the production of spelter and this is having its effect on the market. The price in New York to-day is 5.50c. for prime Western, and the St. Louis market has advanced to 5.35c.

Antimony.—Buyers are taking no interest in the antimony market. Cookson's is offered at 8.15c. and Hallett's at 7.87½c. Hungarian grades are going at from 7.25c. up, and some Chinese grades are being offered at 7.40c. These prices might be shaded.

Old Metals.—The market is inclined to weakness. While dealers' selling prices, quoted below, are unchanged, the inside prices more nearly represent present conditions:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, September 13.—There has been a fair amount of business in copper the past week, chiefly for nearby deliveries. The course of the tin market is so erratic that the price reported to-day may be ancient history to-morrow. There is general expectation of a collapse of the pool which has been manipulating the price of tin. Spelter is stronger and casual buyers have to pay a considerable advance over recent prices. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛ c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.40c. to 5.45c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 25½c.; tin foil, 29c.; block tin pipe, 31c.

Metals, St. Louis, September 12.—Lead is steady at 4.30c.; spelter is strong at 5.32½c. to 5.37½c., the demand very active, both East St. Louis. Zinc ore is firm at $42 per ton, Joplin base. Tin is quoted at 35.85c. per lb.; antimony (Cookson's), 8.55c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals for the five days last week was excellent.

The population of Dayton, Ohio, is 116,577, an increase of 31,244, or 36.6 per cent., as compared with 85,333 in 1900.

Iron and Industrial Stocks

NEW YORK, September 14, 1910.

A condition approaching complete stagnation prevailed in the stock market for the greater part of the past week. Such changes as occurred were usually advances, notwithstanding several occurrences which ordinarily would be expected to have an unfavorable influence on values. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	8½	Pressed St., com.	33¾- 34
Allis-Chalm., pref.	30½- 31	Pressed St., pref.	93 - 94
Beth. Steel, com.	26 - 27¾	Railway Spr., com.	31 - 31¼
Beth. Steel, pref.	57 - 58¼	Railway Spr., pref.	90¼*
Can, com.	7¾- 8⅛	Republic, com.	29 - 31
Can, pref.	66½- 68½	Republic, pref.	94 - 94½
Car & Fdry, com.	46½- 48*	Sloss, com.	55 - 57⅞
Car & Fdry, pref.	113	Pipe, com.	15
Steel Foundries	43	Pipe, pref.	56 - 56⅞
Colorado Fuel	29¾- 30¾	U. S. Steel, com.	66¾- 69½
General Electric	141 -144½	U. S. Steel, pref.	115¾-116¾
Gr. N. ore cert.	54⅝- 56½	Westinghouse Elec.	59⅞- 60
Int. Harv., com.	95⅛- 97½	Chi. Pneu. Tool	35¼- 35¾
Int. Harv., pref.	119¾	Cambria Steel	42 - 43¼
Int. Pump, com.	37¾- 40¾	Lake Sup. Corp.	21 - 22½
Int. Pump, pref.	81 - 82½	Pa. Steel, pref.	108¼
Locomotive, com.	34 - 36½	Crucible St., com.	11⅞- 12⅛
Locomotive, pref.	105	Crucible St., pref.	76 - 76¾

* Ex dividend.

Dividends.—Phelps, Dodge & Co., Inc., have declared the regular quarterly dividend of $2.50 a share, payable September 20.

The International Harvester Company has declared its regular quarterly dividend of 1 per cent. on the common stock, payable October 15.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

Experience with Ferrotitanium Rails.—A pamphlet entitled "Titanium: A Solution of the Rail Problem," has been prepared by the Titanium Alloy Mfg. Company, Pittsburgh, Charles V. Slocum, special agent. Illustrations, correspondence and data of tests are made use of to show the results of the use of ferrotitanium in the manufacture of steel rails; also the results of actual service on various railroads. The New York Central lines are the most extensive users of ferrotitanium rails, nearly 150,000 tons, mostly Bessemer rails, having been taken in the past two or three years. The illustrations are of sections of track laid with ferrotitanium Bessemer and open hearth rails, a number of these being curves on steam and elevated roads. Full page plates are given, showing the severe drop and bending tests to which ferrotitanium rails have been subjected, these indicating great strength and tenacity. It is stated that while in 1908 two railroads were trying ferrotitanium rails, they are now in service on 43 railroads.

Fencing Material Exhibits Desired in South Africa.—J. S. Minnaar, secretary of the Agricultural Society at Middelburg, Cape Colony, has addressed a letter to the American consulate at Cape Town announcing a competition and exhibition of fencing material, appliances and gates in connection with its annual Agricultural Show in March, 1911. The secretary desires American manufacturers to participate. Vice-Consul-General George L. Foster forwards prize lists of the exhibition, copies of which may be obtained from the Bureau of Manufactures, Washington, D. C.

New York has lost first place, at least temporarily, as the greatest producer of money for the Post-office Department. In the statement issued at the Post-office Department, Washington, D. C., September 12, it is shown that the gross postal receipts in Chicago for the month of August aggregated $1,666,484.15, as compared with $1,610,785.42 in New York, showing a balance of $55,698.73 in favor of Chicago.

The Belting & Machinery Company, Rochester, N. Y., has changed hands. The change went into effect August 1. Homer Strong is the new president and James Taylor is manager. The new management proposes to add to the company's lines as rapidly as possible and is making extensive improvements to facilitate the carrying of stock. The company, in fact, has been entirely reorganized, with additional capital, and hopes to carry the largest stock of supplies in western New York State within the next six months.

The Colonial Steel Company, Pittsburgh, Pa., has just placed a contract for the erection of a steel frame brick warehouse at its work at Monaca, Pa. This warehouse will be of modern design, equipped with overhead cranes for economical handling and having ample shipping facilities. Its capacity will be 1000 tons of tool steel bars. In addition to the storage room, there will be provision made and facilities installed for the thorough testing of all tool steel prior to shipment.

The California Legislature has approved a proposition to amend the State constitution by which $10,000,000 can be furnished to the Panama Pacific International Exposition which San Francisco plans to hold in 1915. As the citizens of San Francisco have subscribed $7,500,000, this will make a total of $17,500,000 as a basis on which the city will make its bid to Congress in December for the official approval of that city as the site for an international exposition to celebrate the completion of the Panama Canal.

Foundations have been completed for the new building to be erected by the Union Drawn Steel Company at Beaver Falls, Pa., on the site of the plant destroyed by fire some time ago. Only one part of the company's plant was burned down, its No. 2 plant having escaped the flames and having since been in steady operation to full capacity. The company practically builds all its own machinery, so that it will need to purchase very little equipment for the new plant.

Raw linseed oil reached the highest point in its history September 9, closing at $1 per gallon on the Chicago Board of Trade, an advance of 58 cents over the high point of September last year, when oil sold at 42 cents. The record price previous to this year was 68 cents in December, 1909. The flaxseed crop is short, falling 15,000,000 bushels below annual requirements. The normal price of flaxseed is $1.35 per bushel, while it is now quoted at $2.84.

The Reading Iron Company, Reading, Pa., is one of the few manufacturers of tubular products adhering strictly to wrought iron. Its plant is one of the largest independent tube works in the country, comprising nine mills, capable of producing 210,000 gross tons annually, and it continues to grow. The Reading *Eagle* of August 28 published an illustrated article descriptive of the plant, which has been completely modernized at great cost.

A press dispatch from Pas Mission, Keewatin, Canada, dated September 9, stated that ground had been broken for the Hudson Bay Railway. While no official decision has been reached it is probable that Fort Nelson on Hudson Bay will be the terminal point of the new road.

The W. F. Robertson Steel & Iron Company, Elm and Second streets, Cincinnati, Ohio, is now operating the Marietta tinplate mill, Marietta, Ohio, under contract with the receiver in bankruptcy of the Union Sheet & Tinplate Company.

The Machinery Markets

The railroads are becoming more active in the West, and a decided improvement is shown in the Chicago market. It is understood that the Chicago, Burlington & Quincy Railroad will close out a list amounting to $150,000 within the week, and the Transcontinental Railroad of Canada is buying freely. The Missouri Pacific Railway has one of the largest lists of the year in the market, while large industrial companies are ordering high-class tools and heavy equipment in good volume. Business has also picked up in the Milwaukee market, where some very good export trade is being received, especially from Mexico and British Columbia. In the Southwest power and heating plants are placing good orders. Business is slowly picking up in Pittsburgh, and in other parts of the country trade is in a healthy condition. Business in New York has quieted down within the last two weeks, but there is good future trading in sight.

New York

NEW YORK, September 14, 1910.

There is an absence of new inquiries, and business has fallen off noticeably in the New York market during the last week. A number of large propositions are in contemplation, however, which give promise of materializing shortly and the tone of the trade is mildly optimistic. The railroads, other than the two companies that are closing out against lists which have been mentioned in these columns, are very quiet, but there are indications that trade in that direction will pick up, as inquiries which are coming in from time to time indicate that the purchasing interests of the railroads are beginning to take some notice of the machinery trade. It is said on good authority that during the last year $200,000 worth of gasoline engines have been sold in Rochester alone for use on aeroplanes. The wide experiments that are being conducted in this new enterprise are creating a good demand for the smaller class of gasoline engines. The second-hand machinery trade has picked up during the last week and it seems a peculiar coincidence that a good demand develops in this trade either when times are very dull or very brisk. In rush times orders are placed for second-hand machinery only when manufacturers are unable to supply their wants with new machines, but when trade falls off it seems that manufacturers who take a pessimistic view of the situation economize by making second-hand equipment fill their wants.

A large part of the plant of the Rubberset Brush Company, Newark, N. J., was gutted by fire September 11. The Rubberset Company was a generous customer of the New York market about nine months ago, when its plant was greatly enlarged, and most of the equipment purchased at that time was destroyed by the fire. The loss is estimated at about $200,000 and is fully covered by insurance. It is stated that the company will rebuild at once and will purchase machinery to equip the proposed new structure within the next few weeks.

Four floors of a five-story brick building, occupied by jewelry manufacturers at 102 Murray street, Newark, N. J., were burned out September 11 and much in the way of machinery was destroyed. The building was owned by the Shiman-Miller Company, which recently established a plant in Newark, and the occupants whose equipment was practically destroyed included that company, the Eastwood-Park Company and the Eckford & Ackley Company. All of these companies will require new equipment.

The McKim Foundry & Machine Company, Lockport, N. Y., is in the market for one engine lathe, to be 24 in. by 10 ft.; one screw cutting engine lathe, one milling machine, one keyseater and one 36-in. open side planer.

The Fay Equipment Company has been organized by J. M. Fay and Clinton W. Koons, both well known in the New York machinery trade. The company has established offices at 126 Liberty street, New York, and will deal in a general line of machinery, extending from valves, gauges, brass goods and mill supplies to heavy engines and boilers and including quarrying and contractors' equipment.

The Crescent Foundry Company, Rochester, N. Y., which was organized in January, 1909, has outgrown its present location and has leased a fully equipped foundry at 26 Brown's Race, Rochester. The company does a general jobbing business in gray iron castings.

The Automatic Platen Press Company, 346 Broadway, New York, is arranging to locate a factory at North Tonawanda, N. Y. The citizens of the municipality have agreed to subscribe to $40,000 worth of bonds for the purchase of a site for the proposed plant. The details as to the size of the plant and the company's product are not available as yet.

The Crucible Steel Company of America, 2 Rector street, New York, is arranging to erect a large addition to its plant at Harrison, N. J. The company will spend about $25,000 on a brick and steel structure. The arrangements regarding the equipment have not as yet been made.

The John R. Keim Mills, Buffalo, N. Y., manufacturer of automobile parts and stamped metal work, has purchased additional land adjoining its plant at Kensington avenue and the Erie Railroad, and will build a large extension as soon as plans can be completed.

The Washburn-Crosby Company is building a one-story brick boiler house at its flour mill plant on South Michigan street, Buffalo Creek Railroad and the City Ship Canal at Buffalo.

The Troy Gas Company has let contract for a transformer house 35 x 67 ft., which it will erect and equip at its plant on River street.

The Lafayette Hotel Company, Buffalo, N. Y., will erect and equip a large power house at 216-222 Ellicott street, adjoining the new addition to the Lafayette Hotel at Lafayette Square, Clinton and Ellicott streets.

The Buffalo Brewing Company will erect and equip a one-story brick transformer house at its plant, Clinton street and the Lackawanna Railroad.

Donald F. McLeod, city engineer, Ithaca, N. Y., is receiving bids until September 24 for the furnishing and laying of 9000 ft. of 24-in. cast iron pipe in connection with the building of the new waterworks reservoir and concrete dam.

The E. U. Scoville Company was recently incorporated at Manlius, N. Y., with a capital of $20,000, to take over and continue the business of the late U. V. Scoville, manufacturer of faucets, &c. Gilbert H. Tripp is president of the newly incorporated company.

The Hydraulic Power & Mfg. Company, Niagara Falls, N. Y., contemplates making extensive additions to its power plant, which will largely increase the power capacity. Funds for this purpose will be available from a mortgage of $3,500,000, recently placed by the company.

The Perry Iron Company, Erie, Pa., will build an addition to the casting room at its plant.

The Mead-Morrison Mfg. Company of Cambridge, Mass., engineer and manufacturer of elevating and conveying machinery and hoisting engines, announces a generally good condition of business in its line, and states that it is at the present time working to the extent of its facilities; in fact, it has 50 more machinists engaged than ever before at one time.

Chicago

CHICAGO, ILL., September 13, 1910.

The machinery market shows considerable improvement in September. There is more business being done and the prospective business is assuming larger proportions. The present trend of the market is somewhat peculiar. Large industrial companies are buying quite liberally and their inquiries run to high class tools, including milling machines, boring mills and other heavy equipment. The check in the automobile business has released a large number of milling machines and automatic tools which were ordered last winter and spring for delivery this fall. In many cases the manufacturers of these tools were sold so far ahead that buyers outside of the automobile industry were discouraged from placing orders on account of the long time they would have to wait for delivery. These buyers are now able to get their orders booked for more satisfactory shipment and they are taking advantage of the opportunity. The general demand for tools is not quite so strong as the inquiries from the larger corporations, but it is believed that the smaller buyers will soon fall in line with the general improvement of business conditions throughout the country.

A very encouraging feature of the market is that the

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railroads are showing more concern in their requirements for their shops. It is understood that the Chicago, Burlington & Quincy will close this week on the tools for its Havelock, Neb., shops. The list of this company has been cut down somewhat, but it is believed that the tools purchased will amount to $125,000 to $150,000. The railroads usually find that their appropriation for a tool list does not go as far as their shop experts expect. The improvements which have been made in this class of tools the past 10 years necessarily place a higher price on each tool.

The Transcontinental Railway of Canada is also closing on the very large list issued last spring for its Winnipeg shops.

The Missouri Pacific Railway is in the market with a large list of tools required for 12 shops on that company's system of railroads, and it is known that other important Western railroads contemplate buying tools this fall on a large scale.

The Atchison, Topeka & Santa Fe Railroad had contemplated getting bids on a large list of tools for its shops, but it was found that the appropriation available would not go far towards covering such a list. This company has, therefore, decided to extend its purchases over a period of several months and will order from time to time the tools that are most urgently needed by its mechanical department.

The Wheeler-Clough Company, Chicago, has purchased property on Elston and Lister avenues, on which it will erect at once a one-story varnish factory at a cost of about $100,000.

The Cochrane Pipe Wrench Mfg. Company, recently incorporated with $100,000 capital stock, has purchased a site at Seventy-eighth street and Woodlawn avenue, Chicago, upon which it is erecting a factory for the manufacture of a pipe wrench patented by J. M. Cochrane, the president of the company. It is expected that the factory for which equipment is now being purchased will be ready for occupancy in about 30 days. Walter W. Taylor is treasurer of the company, which may be addressed at 7800 Woodlawn avenue, Chicago.

Walter E. Olson, Chicago, is having plans prepared by F. E. Davidson, 1448 Monadnock Block, for a five-story factory building 75 x 175 ft. It will be of brick and mill construction, with electric elevators and sprinkler system.

The Wolfe-Craig Company, 2832 South Green street, Chicago, manufacturer of metal specialties, has increased its capital stock from $3000 to $12,000.

The Stover Engine Works, Freeport, Ill., has increased its capital stock from 125,000 to $130,000.

The Meadows Mfg. Company, Meadows, Ill., is erecting a two-story factory building at Pontiac, Ill., which it will occupy about December 1.

The assets of the Wabash River Power Company, located at the rapids, near Mount Carmel, Ill., and formerly owned by Fort Wayne, Ind., capitalists, have been purchased by a syndicate of New York, Illinois and Colorado capitalists, among whom are J. B. Blackman of Harrisburg, Ill., president of the Saline Trust & Savings Bank of that city. The company has an engineer at work making surveys with a view to installing a large hydroelectric plant.

R. B. Baylies, Chicago, is having plans prepared by A. E. Robinson, 84 La Salle street, for a three-story garage and machine shop, 60 x 150 ft., to be erected at 2243-2245 Wabash avenue. It will be of reinforced concrete and brick construction, with steam heating and electric freight elevator.

The Interstate Garage, Chicago, has purchased the property at 2630-2632 Wabash avenue and will immediately begin the erection of a modern garage and machine shop. Plans for the building, which will be a two story brick structure, are being drawn by Shank & Co., 108 La Salle street, and it is understood that the building will be ready for occupancy in about two months.

Bernard Barthel, engineer, 79 Dearborn street, Chicago, is preparing plans for the following equipment to be installed in the Del Prado Hotel, Fifty-ninth street and Madison avenue: Two 200 hp. internally fired Scotch marine boilers, one 250-kw. generator, one 12-ton refrigerating machine, feed water heater, electrical work, steam heating and pumps. The same engineer is also preparing plans for an office and bottling house for the Clinton Brewing Company, Clinton, Iowa, which will require seven electric motors and one 150 hp. boiler.

The Best Mfg. Company, Peoria, Ill., has filed articles of incorporation with $40,000 capital stock. The company has a plant in Peoria, its principal line of manufacture being mill work.

The Fowler Mfg. Company, Alexandria, Ill., is completing negotiations for the erection of a large factory for the manufacture of gasoline motor cars and vehicles. The company at present operates a factory for the manufacture of vending machines, novelties and patented articles.

C. W. Sandell, manager of the brick factory at Hillsboro, Ind., advises that he is in the market for a new cement tile machine of larger capacity than the one now operated, which is 12 in. Machinery for the manufacture of Portland cement may also be purchased later on.

The Healy Engineering Company, Moline, Ill., has awarded a contract to the Leonard Construction Company, Chicago, for the construction of a manufacturing plant, 80 x 400 ft.

G. D. Glaser, 703 Washington Boulevard, Chicago, is having plans prepared by Ottenheimer, Stein & Reichert, architects, for a three-story factory building, 95 x 425 ft. It will be of concrete, brick and mill construction, and will have sprinkler system, steam heating and electric freight elevators.

The Kewanee Foundry & Mfg. Company, Kewanee, Ill., is contemplating the erection of a foundry and machine shop, 60 x 150 ft.

Philadelphia

PHILADELPHIA, PA., September 13, 1910.

While the actual volume of business transacted by machine tool builders, as well as merchants, has not shown any pronounced betterment during the past week, a much more satisfactory inquiry for both tools and machinery undoubtedly developed during the early portion of September. The greater part of the recent demand has been for single tools, although here and there users are looking around for more extended requirements, but nothing in the way of a sizeable list has developed. In a few cases recent inquiries have already developed into orders, but as a rule business closes up rather slowly. Sales of a few heavy tools to industrial plants in this territory are reported, while negotiations for others are still pending. Reports of cancellations of orders occasionally crop out, these have, however, been largely confined to such tools as those on which makers, at the time of their purchase, were unable to make deliveries inside of eight and ten months, or even longer periods, and prospective purchasers have been able either to obtain other tools for earlier delivery or find that conditions have since developed under which they are able to get along without the proposed equipment, and consequently canceled their orders.

Developments as far as the railroads are concerned show no change. The Pennsylvania Railroad has placed orders for a few odd tools, which as a rule have been before the trade for some time, and, while some further inquiries from this road are expected, they seem to be in no haste to make their wants known. Locomotive orders have not been very active, although the local builder is pretty fully engaged. Makers of heavy engines, boilers and general power and transmission equipment do not report any marked improvement in the demand, although they are as a rule pretty actively engaged with work already on their books. Very little movement in the export trade is to be noted in this territory.

Machine tool builders, as well as industrial plants generally, are operating at a fairly even basis; some of the larger concerns are running at about 70 to 75 per cent. of full capacity, with sufficient business coming in to enable them to about maintain that rate for some time ahead. In the foundry trades new business, as far as the requirements from the machine tool field are concerned, has been comparatively light. A fair business is reported in the jobbing foundry trade. In some instances makers of small steel castings are not quite so actively engaged.

Plans have been completed by Stearns & Castor for the erection of a new power plant at the Baron De Hirsch Agricultural School at Woodbine, N. J.

The contract for the addition to the plant of the Arguto Oilless Bearing Company, Berkley street below Wayne avenue, has been awarded to William C. Wright. The building will be 45 x 83 ft.

The United Gas Improvement Company will build a one-story chemical laboratory in connection with its plant at Atlantic City, N. J. The contract for the building has, it is understood, been let to W. W. Lindsay & Co. of this city.

The Camden Ferry Company, Elizabeth City, N. C., will open bids for a Scherzer roller lift bridge on September 26. John W. Hays, Petersburg, Va., is the engineer in charge of the work.

Preliminary plans for a large garage, to be erected by George C. Boldt at 1401-1409 Locust street, have been completed by Hewitt & Paist. Plans call for a building, 103 x 150 ft. It is not yet decided when the erection of the proposed garage will be started.

The C. C. Knight Company has sold its six-story concrete factory building at Sixteenth and Callowhill streets, completed a year or so ago, to Louis J. Bergdoll of the Bergdoll Motor Car Company, which will use the upper floors of the building for automobile construction work. The C. C. Knight Company will continue the merchant iron and steel business at the same location, occupying the first floor of

S. DIESCHER & SONS,
Mechanical and Civil Engineers,

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the building under a long lease. The size of the building is 100 x 179 ft. 8 in.

The Crook-Horner Supply Company, Baltimore, Md., has acquired a large two-story warehouse at 11 Balderston street, in that city, where it will conduct, after necessary improvements are completed, a general machinery, plumbing and mill supply business.

Announcement has been made in Baltimore, Md., that new bids were being taken for the erection of the Washington County Hospital, at Hagerstown, Md. James Ritchie, architect and engineer, Boston, Mass., is taking proposals.

The Hess Machine Works, Philadelphia, reports a very fair inquiry for file making, as well as general machinery, but notes that orders do not close very satisfactorily. This company continues quite busy and has shipped recently three sets of file making machines to a Western customer, one set to a buyer in New England and five sets for export to Germany.

The Hamburg Boiler Works, Hamburg, Berks County, Pa., is ready to take bids on a steel addition to its works, 20 x 100 ft., one story, to be used as a flanging shop.

Cleveland

CLEVELAND, OHIO, September 13, 1910.

The local machine tool market continues quite dull, although it shows somewhat more life than a month ago. Machinery houses report that the demand at present is mostly from small shops for medium-sized and small tools. No inquiries for good-sized lots of tools are pending. There is a good demand for small second-hand tools, but little call for large tools. Outside of some single tool orders very little business is coming from the automobile trade. The situation in that industry is regarded as more favorable than a month ago. Automobile manufacturers appear confident of a heavy volume of business during the coming year, but with the large plant extensions during the past year or two they are not expected to do much in the way of further additions. Instead of the heavy volume of orders that came from this industry last fall machinery dealers are looking for only about enough small orders to keep present plants up in good shape. That the outlook in this industry is improved is indicated by the fact that some of the orders for machine tools that were held up during the summer have been reinstated. Machine tool builders are generally busy on old orders and some report a fair volume of new business. Among the inquiries pending is one for 32 large portable drills.

Builders of handling machinery are getting a good volume of orders for small cranes and hoists, and some good business is in prospect in the line of coal and ore handling machinery. The demand for locomotive cranes is less active than earlier in the season.

Railroad orders are generally being held back and very little business is coming from that source. The Lake Shore Railroad has placed an order for generators for its new Elkhart shops, and will shortly buy motors to the capacity of about 5000 hp. for the same shops. In electrical equipment the demand for small and medium-sized motors continues fairly good.

The new ore handling plant that is being erected by the New York, Pennsylvania & Ohio Dock Company, at Randall, Ohio, a suburb of Cleveland on the Erie Railroad, is nearing completion and will be ready for operation about October 1. The plant will have a capacity of handling over 1,000,000 tons of ore a year. The equipment consists of a 456-ft. bridge, built by Heyl & Patterson of Pittsburgh, and a car dumper, built by the Wellman-Seaver-Morgan Company of Cleveland. The bridge is equipped with a 12-ton bucket and is capable of handling 500 tons of ore an hour. There is a power plant of 1200 hp. capacity. This has Babcock & Wilcox boilers, two 600-hp. Buckeye cross compound engines and two 300-kw. Allis-Chalmers generators.

The Electric Controller & Mfg. Company, which recently purchased a site for a new plant at Eightieth street and Bessemer avenue in Cleveland, has engaged Geo. S. Rider & Co., engineers, to prepare plans, and expects to begin the construction of its new plant early next spring.

The New Idea Spreader Company, Coldwater, Ohio, has awarded contracts for the erection of a new plant, 60 x 800 ft. Anton Burchard, engineer, Cleveland, has the contract for the electrical installation, power house and transmission machinery; A. DeCurtins, Lima, Ohio, the contract for the building, and Ammerman, McCall & Anderson, Detroit, Mich., the contract for the heating and ventilating. The power plant will be 200 hp.

The A. E. Russ Company, Cleveland, maker of beer pumps and beer pump supplies, now located at 6813 Wade Park avenue, has completed plans for the erection of a new plant on Walworth avenue, S. W., near West Fifty-eighth street, on which work will be started at once. The plant will include a main building, 60 x 200 ft., and a foundry, 40 x 80 ft. The construction will be of brick.

The Tyson Company, Canton, Ohio, has been incorporated with a capital stock of $75,000 to manufacture ice cream freezers, pasteurizers and other machinery of a similar character. The company will erect a new plant, about 50 x 150 ft., and will move its present plant to a new site recently purchased. The incorporators are Frank Tyson, Joseph Biechele, Sr., Joseph Biechele, Jr., Stephen Francis and William Shoop.

The Hinde & Dauch Paper Company, Sandusky, Ohio, will soon begin the erection of a new paper mill, including several one and two story buildings. Plans for the plant are being prepared by Albert N. Allen, consulting engineer, Cleveland.

The Brown Hoisting Machinery Company, Cleveland, reports the receipt of a good volume of small orders for cranes and hoists, and some inquiry for equipment for large handling plants. The company now has enough work on hand to keep its plant running full through the remainder of the year.

The Cleveland Electric Illuminating Company has placed a contract with the General Electric Company for two 15,000-kw. steam turbines for its new plant at the foot of East Seventieth street. Exciters and other equipment will be purchased later.

The City Council of Akron, Ohio, has acted favorably on the question of building a new water works plant in that city and the matter will be submitted to the voters October 25, when a bond issue of $750,000 for that purpose will be voted on.

It is announced from Niles, Ohio, that a new sub-station and car barns will be erected in that city by the Mahoning Valley Street Car Line, involving an expenditure of $100,000. The sub-station will be equipped with two 500-kw. rotary converters.

The municipal water works plant in Canton, Ohio, will be enlarged by the erection of an auxiliary pumping station, with a daily capacity of 2,000,000 gals.

George Westwater & Co., Columbus, Ohio, have secured the contract on a bid of $27,527 for erecting a water works plant in Utica, Ohio.

The City Council of Toledo, Ohio, is planning the expenditure of $200,000 in the enlargement of the municipal water filtration plant.

The Republic Rubber Company, Youngstown, Ohio, has awarded a contract to the Reaugh Construction Company of Cleveland, Ohio, for the construction of a five-story and basement manufacturing plant to be erected at a cost of about $100,000.

Cincinnati

CINCINNATI, OHIO, September 13, 1910.

As compared with nearby previous weeks, a decidedly better condition is to be noted in the machine tool industry. A number of scattered orders have been received from the railroads during the past few days, and business from the general trade is holding up remarkably well. A distinctly encouraging feature is the large number of inquiries being received by machine tool builders, which are coming from all parts of the country. The export trade has also been very good lately and more attention is being paid to this particular branch than probably ever before. A few orders are also to be reported from the automobile industry.

Dealers in machinery supplies, such as valves, packing, hose, &c., note an increase in orders coming in and their salesmen report a better feeling as generally prevailing in this immediate vicinity.

The foundries are running along about as usual, and those who have no large contracts booked ahead manage to obtain enough day to day business to keep a full force at work.

Machinery Hall of the Ohio Valley Exposition, Cincinnati, has been a meeting point for many outside visitors and local exhibitors. Among the local machinery exhibits that are attracting attention are a vertical milling machine made by the Cincinnati Milling Machine Company; a radial drill from the Cincinnati-Bickford Tool Company; an automatic gear cutter, furnished by the Cincinnati Gear Cutting Machine Company, and a 22 in. by 22 in. by 6 ft. planer from the Cincinnati Planer Company. The Lodge & Shipley Machine Tool Company has one of its latest type of 20-in. engine lathes installed, and the Acme Machine Tool Company is showing one of its latest type turret lathes. The J. A.

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Fay & Egan Company's booth contains a number of woodworking machines, and that of the Hisey-Wolf Machine Tool Company a full assortment of its electric drills. The Lunkenheimer Company's exhibit shows a full line of its engineering specialties. The Triumph Electric Company is exhibiting several types of generators and motors and a 30-ton ice machine; it is also furnishing motors for nearly all electrically driven machines throughout the exposition buildings. I. & E. Greenwald have a Corliss engine and a number of large gear wheels in their exhibit. Outside exhibitors include the General Electric Company, the Westinghouse Company and the Allis-Chalmers Company.

The plant of the Cincinnati Punch & Shear Company is one of the local industries which has been very busy all summer. Recent orders received include a large double punch to be shipped the Trans-Siberian Railroad at Amur, Siberia; a deep throat No. 2 punch for the Arecibo Railroad, San Juan, Porto Rico; a 16-in. and a 36-in. double punch for the National Railways of Mexico. Domestic orders have also been good lately and a 60-in. plate shear, to cut ½-in. aluminum plates has just been shipped the Aluminum Company of America, Niagara Falls, N. Y.; two double punching machines each to the Davenport Company and Baker Iron Works, Los Angeles, Cal., and a large triple geared bending roll mill is now being built for Bartlett & Hayward Company, Baltimore, Md.

Work is being pushed rapidly on the new reinforced concrete building of the Ohio Mechanics' Institute on Walnut street, Cincinnati. The auditorium is expected to be ready for use within a few months, but on account of power arrangements yet to be made it is not expected that the institute will move all its departments into the new quarters until the latter part of next year.

The new addition to the plant of the Hall Safe & Lock Company, Cincinnati, is nearly completed, and the company's output of safes will be very much increased.

The new factory building of the Baxter Stove Company, Mansfield, Ohio, to take the place of the structure recently burned, will soon be ready for occupancy. The new plant will be quite an improvement over the one destroyed.

The Rossville Distilling Company, Lawrenceburg, Ind., is building a new boiler house, and the additional boilers to be installed will bring the total capacity of the power plant up to 1500 hp.

The five-story reinforced concrete building that the Lunkenheimer Company is erecting as an addition to its plant at Lawnway avenue and Tremont street, Cincinnati, is nearly completed and the company has already moved its brass foundry to the top floor of the new building. Other departments will follow soon and before January 1 the addition will be in full operation.

The Baldwin Piano Company announces that it has postponed the erection of an addition to its factory on Reading road, Cincinnati. The contemplated extensions called for an expenditure of over $60,000, and it is understood that some time next year the orginal building plans of the company will be carried out.

The Fox Paper Company will commence the installation of machinery in its new plant on Lockland avenue, Cincinnati, some time next month. The new factory is about completed and is expected to be in operation before the fall season is over. All the necessary machinery and equipment has been purchased.

The Seneca Chain Company, Kent, Ohio, has awarded contract to the Mt. Vernon Bridge Company for the erection of a plant to replace one recently destroyed by fire. Work will commence at an early date. The buildings are to be of reinforced concrete construction.

Lynch & Eady, Louisville, Ky., have secured contract for the erection of a filtration plant for Georgetown, Ky. It is stated that L. M. Booth & Co., New York, have contract for the necessary machinery.

The Chas. Boldt Glass Company, Cincinnati, has taken out a permit for the erection of a one-story glass factory at Davis lane and the Pennsylvania Railroad.

The Dayton Electromobile Company, Dayton, Ohio, has been incorporated with $250,000 capital stock. The incorporators, who are all Dayton men, are John L. Baker, William Pflum, H. B. Brentlinger, Geo. L. Baker and C. W. Dale. No building plans have yet been announced.

The Lodge & Shipley Machine Tool Company, Cincinnati, has recently received an order for several engine lathes from the Gunn Motor Company, a new automobile manufacturer, at Utica, N. Y.

The Cincinnati Iron & Steel Company reports a recent sale of seven electric traveling cranes to the R. K. LeBlond Machine Tool Company, Cincinnati, to be installed in the new factory additions now being erected at East End by the LeBlond Company.

Indianapolis

INDIANAPOLIS, September 12, 1910.

The Field Mfg. Company, Bloomington, Ind., has been incorporated with $20,000 capital stock to manufacture cans and other articles. The directors are Leonard S., Frank M. and L. C. Field, J. W. O'Harrow and F. C. Dailey.

The Batesville Electric Light & Power Company, Batesville, Ind., has been incorporated to supply municipal and domestic light, heat, power and water. The directors are J. A. Hillenbrand, A. W. Romweber and Harry Blank.

The Bishop & Babcock Opal Onyx Soda Fountain Company's plant at Indianapolis, Ind., was burned September 7, with a loss of $60,000. E. J. Kane is manager of the plant. The Marietta Glass Company, Indianapolis, owned the building, on which the loss was $65,000. The plant will be rebuilt.

The South Bend Bait Company, South Bend, Ind., has increased its capital stock to $25,000.

The plant of the Furnas Office & Bank Furniture Company, Indianapolis, Ind., was burned September 9, with $30,000 loss. The loss is covered by insurance, and the plant will be rebuilt.

The directors of the Bell Smokeless Powder Company, St. Paul, Ind., have elected Harry Ballard of St. Paul to succeed Dr. J. W. Bell as president. William V. Dorsey of Shelbyville, Ind., was elected treasurer to succeed Mr. Ballard.

The Bedford Stone Settting Company, Bedford, Ind., has been incorporated with $25,000 capital stock, to do a stone construction business. The directors are William E. Powers, William S. Holcomb and Louis Roberts.

The Freeman Mfg. Company has been incorporated at Alexandria, Ind., to manufacture gasoline light and heating apparatus. The directors are A. S. Freeman, V. S. Day and V. H. Day.

The Heimberger & Drinkard Veneer Mills has been incorporated at New Albany, Ind., with $50,000 capital stock to manufacture veneers. The directors are Adam Heimberger, Harry E. Heimberger and Clarence L. Drinkard.

The Central Wire & Iron Company, Indianapolis, Ind., has been incorporated with $5000 capital stock to manufacture iron and wire novelties. The directors are Frederick Phillips, Emma Schiffman and D. J. Phillips.

The Jett-White Electric Company, Evansville, Ind., has been incorporated with $10,000 capital stock to manufacture electric supplies. The directors are Charles E. Jett, Elmer S. White and Fred M. Hostetter.

The Oakes Mfg. Company, Tipton, Ind., will make additions to its plant in order to take care of increasing number of orders for its manufactured product—incubators.

The Town Council and Commercial Club of Parker City, Ind., are planning the establishment of a municipal lighting plant, either electricity or acetylene.

The Hoyt Electric Company, Indianapolis, Ind., has been incorporated with $50,000 capital stock to manufacture electrical devices. The directors are E. S. Van Camp, E. V. H. Shockney and E. T. Hoyt.

The Muncie Gas Engine & Supply Company, Muncie, Ind., has found it necessary to enlarge its plant, due to orders for an engine, the invention of one of the employes, that burns crude oil rather than refined oil or gasoline.

At the recent annual meeting of the Indiana Electric Light Association, one of the chief matters discussed was municipal ownership of public utilities. The leaders in the discussion pronounced municipal ownership in the State a failure, in so far as electric light plants were concerned. Several causes were assigned. It was pointed out that the directors of such plants were usually mayors and members of the councils, with no knowledge of electrical matters; under them the city clerk, who acted in various capacities for the plant; next the superintendent, at the beck and call of the council, clerk, fire chief, police chief and mayor—everybody's business, nobody's business. It was said the agitation for municipal ownership was decreasing in proportion to the progress made by private ownership in getting in closer touch with the people and cultivating their good-will.

The Improved Block Railway Signal System has been incorporated at Hammond, Ind., with $50,000 capital stock, to manufacture block signal systems. The directors are Charles D. Anderson, Howard Ross and Cornelia S. Benepe.

J. B. Blackman, banker, Harrisburg, Ill., is trustee for the Wabash River Power Syndicate that has taken over the assets of the Wabash River Power Company, at Grand Rapids, Ill., formerly owned by capitalists of Ft. Wayne, Ind. There is a dam at that point on the Wabash River, constructed by the Government. It is 1185 ft. long and gives a fall of 11½ ft. It is proposed to lower the river bed below the dam so as to get a fall of 17½ ft., and to build a public service plant. The estimated cost is $500,000.

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Two additions, each 300 ft. long, are being built to the plant of the Maxwell-Briscoe Motor Company, at Newcastle, Ind., and plans are being made for a third addition, 20 x 320 ft. With these completed the plant will give employment to 2500 hands. Of the 7000 cars it is proposed to build for the export trade next season, 3000 will be made at this Newcastle plant of the United States Motor Company.

The Southern Veneer Mfg. Company, Louisville, Ky., is receiving bids for the construction of a two-story machine shop.

The Chapman Steel Company, Indianapolis, Ind., has plans in progress for the construction of a one-story factory building, 225 x 300 ft.

Detroit

DETROIT, MICH., September 13, 1910.

Autumn trade has been opening up in fairly good shape. Small orders predominate, but in the aggregate they stand for considerably more business than was obtainable last month, and practically every branch of industry is well represented in current buying. There has developed lately among both manufacturers and dealers a marked disposition to place less dependence upon any one source of business, such as the automobile and auto parts factories, and to cultivate trade wherever it may be found. Committees of the Detroit Chamber of Commerce, both independently and in co-operation with other commercial organizations of this section, are planning to help this idea along, while, individual machinery houses will inaugurate systematic sales campaigns, in which advertising is to play a strong part. It is felt locally that conditions were never better for a sustained effort of this kind than they are at the present time.

The erection of a thoroughly modern factory with electric motor drive, at Grand Rapids, Mich., is contemplated by the Crawford Chair Company, Grand Ledge, Mich., but plans to that end have not yet been fully matured.

The Bates & Edmonds Motor Company, Lansing, Mich., is manufacturing a line of gasoline engines adapted to practically every character of service, all being of the open jacket pattern.

The name of the Bailey Motor Truck Company, Detroit, has been changed to the Federal Motor Truck Company.

Smith, Hinchman & Grylls, Detroit, are preparing plans for an addition to be made to the power house of the city's electric power and lighting plant. The work is in charge of the Public Lighting Commission, 40 Atwater street, Detroit.

The Lavigne Mfg. Company, Detroit, is putting on the market an automatic oiler for gas engines which has proven very successful in service, and has sold largely this season in all parts of the United States. An increase of manufacturing facilities has been found necessary, and the first step in this will be the erection of a four-story addition, 100 x 100 ft., to its present plant.

The Ann Arbor Machine Company, Ann Arbor, Mich., is devoting its entire plant to the production of a portable power baler, which is more largely in demand this season than ever before.

Important developments in the purchase of new and heavier equipment may result with the next few months from extensive exportation work now being carried on by the Wolverine Copper Mining Company, Houghton, Mich.

The city of Oxford, Mich., which has a combined electric power and water works station, will purchase in the near future a motor driven centrifugal pump of about 500,000 gal. capacity daily.

The Menominee Saw Company, Menominee, Mich., which has a large established trade in all sections of the country in saws, knives and cutters of various kinds, is looking forward to a good run of fall business and a very active winter.

The Field-Brundage Company, Jackson, Mich., is putting on the market a very simple, compact type of gasoline engine, in sizes from 6 to 15 hp., which has been extensively sold through the United States for a wide variety of service.

The Huron Mining Company, Iron River, Mich., has a new iron ore crushing plant in commission, and it is stated that by the beginning of another season further improvements will be effected, as development work is to be pushed.

A very simple and effective apparatus of the character indicated in its title is manufactured at Vicksburg, Mich., by the Eclipse Oil Pump Company. This has no valves, plungers, cranks, eccentrics or connecting rods, and there is practically nothing to get out of order.

Wm. E. Metzger, president of the Metzger Motor Company, Detroit, stated in a recent published interview that the conservative manufacturer of a good automobile has nothing to fear for the season of 1911, which will, in his judgment, be one of the most substantial the trade has known. Increased purchasing by farmers is certain to be a feature of the trade.

The M. Garland Company, Bay City, Mich., has had a large trade in the aggregate this season with every timber cutting section of the country, including the Pacific Coast. In addition to its standard lines, the company manufactures a good deal of special machinery.

The Charfield Brass & Iron Works Company, Escanaba, Mich., which now constitutes one of the leading industries in its line on the upper peninsula, will erect an addition, 40 x 80 ft., to form a new front for its present plant.

The Arbuckle-Ryan Company, Toledo, Ohio, has been awarded the contract for the delivery and installation of two 72-in. x 18 ft. tubular boilers, tandem compound engine of 300 hp. and a centrifugal pump with 36-in. discharge, for a pumping station to be built in the vicinity of Rushville, Ill., by the Crane Creek Drainage & Levee District, whose headquarters are located there.

Reports persistently circulated lately with reference to the heavy overproduction of the Buick Motor Company, Flint, Mich., and alleged sacrifice of this year's stock at very low prices, are without any basis of fact, as any one will find who tries to buy one of these cars at less than the present regular quotation.

The Ayres Engine & Motor Company, incorporated here not long ago, has had plans prepared by Smith, Hinchman & Graylls, Detroit, for a new factory in Trenton, Mich., the initial unit of which will be 50 x 175 ft. Gasoline engines, principally for motor boat service and driving agricultural machinery, will be the product of the plant.

The plans of the McRae & Roberts Company, Detroit, for a new brass factory, consisting of foundry, finishing shop and power plant, are now complete, and the construction contracts will be let this month. Equipment details are reported to be under consideration.

The authorities at Harbor Springs, Mich., are having plans and specifications drawn for a steam pumping plant and water distribution system embodying features of the most modern design.

The Fennia Mfg. Company, Hancock, Mich., recently incorporated, held the first meeting of the Board of Directors September 2, and elected the following officers for the ensuing year: Joseph O. Ostman, president; Axel A. Immo, vice-president; Wm. Arthur Abramson, secretary; John Olson, treasurer. The company will manufacture dial levels and novelties and act as general machinists. A decision has not been reached as yet regarding the erection of a plant.

The Krit Motor Car Company Detroit, will add two stories to its present plant on the Detroit River front.

The South

NASHVILLE, TENN., September 12, 1910.

In the line of foundry, boiler making and machine shop equipment some fairly good orders have recently developed at various points in the South, plants that make a specialty of repair work being the best buyers. On any standard tool reasonably prompt delivery can now be obtained, so that users do not feel the need of placing orders very far ahead. The large mills and other manufacturing establishments have yet to make up their lists. Most of the officials responsible for their management have been absent on the usual summer vacation trips, and the attention of those now on the ground is occupied mainly by an accumulation of various operating details which will have to be disposed of first before purchases of additional machinery or replacements are considered. Before the end of October, however, there will undoubtedly be a nice line of business obtainable from these plants. Meanwhile, some of the smaller manufacturers and other industrial interests will be giving increasing support to the market, and the situation is most promising.

The Southern Veneer Mfg. Company, Louisville, Ky., whose plans for rebuilding have previously been mentioned, are starting work on the construction of a large plant equipped with power and operating machinery of the most modern design. Two buildings, 50 x 185 ft. and 40 x 80 ft., will be completed first. Some of the equipment needed has already been provided for, and the remainder will be purchased as required.

Funds for the installation of a municipal electric plant and water works system will be available some time this fall at Hartselle, Ala.

The National Blow Pipe & Mfg. Company, Ltd., New Orleans, La., is putting on the market a type of exhaust fan operating at slow speed, which takes comparatively

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little power for its capacity and is very efficient in service. The company makes a specialty of installing these machines in connection with complete systems for removing refuse from planing mills, woodworking plants, &c.

The Carolina & Northwestern Railway, Chester, S. C., is having plans prepared for new shops to replace the plant that was recently destroyed by fire. It has not yet been decided where they will be built, as several points along the line are being considered.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., is starting the fall season with considerably enlarged facilities for production.

Bids on an electric generating set and motor driven pump of moderate capacities will be taken until September 30 by W. G. Raoul, Gould Building, Atlanta, Ga., for one of the State institutions located at Alto, Ga. In operating the dynamo a gasoline or oil engine is to be used.

Among contracts recently taken by the Nashville Bridge Company, Nashville, Tenn., is one for a large steel structure at Link Ford, near Waverly, Tenn.

One of the busiest of the large Southern sales agencies this season is that of the Wilmont Machinery Company, New Orleans, La., which handles such standard lines of equipment as the pumps and hydraulic apparatus manufactured by the Deming Company, Salem, Ohio; timber cutting machinery from the shops of the M. Garland Company, Bay City, Mich.; the various products of the Lambert Hoisting Engine Company, Newark, N. J., and the conveying systems of the Link-Belt Company, Chicago. During the summer trade in all of these lines fell off, as usual, but the closing months of the year promise to be exceptionally active.

The city of Crowley, La., has awarded the contract for a 250-hp. high speed automatic engine, with pump direct connected, to the Skinner Engine Company, Erie, Pa.

In addition to its well-known line of boilers, which are carried in stock for immediate shipment, the Walsh & Weidner Boiler Company, Chattanooga, Tenn., has built up a large trade in related lines, such as the manufacture and erection of steel casings, stacks, breechings, &c.

Plans are under discussion at Dillon, S. C., for the building of a city power plant. The matter will probably be decided this month.

The Turner, Day & Woolworth Company, Louisville, Ky., will henceforth be buyers of electrical equipment and supplies, having installed motors for driving the machinery in its factory.

Work has been commenced on the new pumping station for the city of Chattanooga, Tenn.

The Hazen Power Company, Hazen, Ark., is preparing to establish a large plant. The contract for the machinery calls for one 250-hp. Corliss engine and a battery of boilers of 300 hp. pressure with electric generators in proportion. It is expected that the plant will be completed and ready for operation by March 1. A 10-ton ice plant is to be operated in connection.

The city of Cleveland, Miss., has sold $25,000 worth of municipal water works bonds, and an improvement to the value of $20,000 will be made at once.

Extensive improvements are being made in the Gadsden Car Works operated by the Alabama Great Southern Railroad, at Gadsden, Ala. The plant is now employing about 400 men.

The Southern Shovel Mfg. Company has reopened its plant at Gadsden, Ala. The plant was closed down for some time because of overproduction. About 50 men are employed.

The Panchrome Press Mfg. Company, Inc., has been organized at Corinth, Miss., to manufacture an attachment applicable to printing presses, by means of which printing in various colors can be done with one impression.

The J. M. Barnett Company, Walsh, La., is in the market for a modern ice making plant, and also intends to purchase equipment for a small power station to furnish electric light to the municipalities.

Pittsburgh

PITTSBURGH, PA., September 13, 1910.

The improvement in the market for machinery is rather slow. Inquiries are liberal and in some lines trade has recently been very good, but taking conditions as a whole there does not seem to have been any large volume of actual bookings made thus far this month. Everything points at present to a gradual upward trend, with a noteworthy absence of any abrupt transition from the usual summer dullness to fall activity. The trade is, however, in a healthy condition, and comparatively little stimulus is needed to force autumn production to a high figure. Buying in behalf of certain large interests, which was expected to take place at about this time, has not yet materialized, and a considerable percentage of this may be delayed until after the Congressional campaign is over; but some sizeable contracts cannot fail to come out between now and the middle of October, as other work that will before long be pressing for completion is dependent upon them.

Manufacturers and district office salesmen here are figuring on the auxiliary equipment for the new steam turbine power plant of the Mt. Vernon Railway & Light Company, Mt. Vernon, Ohio, the boilers and generating units for which were recently purchased.

It is reported locally that the Pittsburgh Journal Bearing Company, incorporated for $150,000, has been organized here by D. H. Stewart and Archibald Mackrell, Pittsburgh; Wm. Connor, Braddock, Pa., and Jas. L. Adams, Coraopolis, Pa., to establish a plant for the manufacture of bearings for the journals of car and locomotive trucks.

The Russell Car & Snow Plow Company, Ridgeway, Pa., which is making a specialty of a double truck machine with flanges for heavy interurban service, will be occupied during the fall on orders in hand or pending for early winter delivery, as the roads that put off purchasing equipment of this kind are now buying.

Among prospective builders of power plants for traction service is the Buckhannon Western & Glenville Electric Railway Company, recently organized at Buckhannon, W. Va., by L. H. Morrison and others. The plans of the company have not yet, however, been fully matured.

From Sullivan, Ind., it is reported that the Consolidated Indiana Coal Company is installing electric haulage in two of its mines, one of which is being opened up again after lying idle for several years. The principal equipment has been ordered from representatives of local manufacturers.

Chas. F. Scott, consulting engineer of the Westinghouse Electric & Mfg. Company, has consented to serve as chairman of a board of prominent engineers of this section, who will advise with the faculty of the University of Pittsburgh on all matters pertaining to the engineering courses, thereby giving students the benefit of the best practical experience.

One of the largest electric generating plants to be owned by a commercial power company in this district will be built at Wheeling, W. Va., by the Wheeling Electrical Company, which is planning to furnish current to manufacturing concerns of that vicinity.

The construction of a municipal power and pumping station is under consideration at Shepherdstown, W. Va.

The Westinghouse Electric & Mfg. Company, Pittsburgh, continues to do a very satisfactory business, and it is reported that some new shop equipment has recently been ordered to provide facilities urgently needed in the production department. Shipments during July were larger than for any month in the company's history, and this record was again exceeded in August. The Westinghouse Machine Company is similarly active, among the contracts now on its books being a number for steam turbine units of large capacity.

The Warren Axe & Tool Company, Warren Pa., will be busy during the fall stocking up dealers that sell to the logging trade, which is expected to be very lively in all of the Northern timber cutting districts.

A 3000-kw. low pressure steam turbine, operating on the exhaust from other units in the station, is being installed by the Columbus (Ohio) Railway & Light Company.

Owing to the project that has been developed lately by city officials for supplying commercial power to industrial plants for operating motor driven machinery, the steam turbine plant belonging to the municipality at Columbus, Ohio, may be increased in capacity. It is at present equipped with units of 4500 kw., furnished by the Westinghouse Electric & Mfg. Company, Pittsburgh, and the Allis-Chalmers Company, Milwaukee.

The Jacobson Machine Mfg. Company, Warren, Pa., is building an improved type of gasoline engine, in sizes up to 60 hp., with automatic draining water tank, which can be made readily portable as a complete unit and used for a great variety of service.

Specifications can be obtained from the office of the United States Engineer, Wheeling, W. Va., covering two boilers of 115 hp. each, two steam driven air compressors and other equipment for erection at one of the new dams on the Ohio River. Bids are to be taken until September 29.

The Riblet Heater Company, Erie, Pa., is making rapid progress in the introduction of a feed water heater radically different in construction from anything else of the kind, having a guaranteed efficiency that is claimed to be higher than any apparatus of the same rating sold in competition. Being made entirely from cast iron there is nothing to get out of order, and one of these heaters will outlast several boilers.

Machinery for mining and coking operations, timber cutting and the manufacture of wood products will be required in due course by the Aracoma Coal Company, Logan, W. Va., in which E. B. Hubbard of that place is the moving

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spirit. The company was recently incorporated and has extensive holdings in that vicinity.

The Aluminum Company of America, Pittsburgh, is finding one excellent outlet for its product in the electric railway field, where it has proven practicable to use aluminum feeder lines for power transmission that are less than half the weight of copper wire and of equal strength and conductivity.

The Pittsburgh office of Wickes Brothers is distributing that firm's monthly stock list of boilers, engines, pumps, shop tools and electrical machinery, which are ready for prompt delivery.

Jos. F. Eberly, Westfield, Pa., manufacturer of leather goods, is erecting a factory, 50 x 200 ft., with a wing, 56 x 75 ft., one story, of brick reinforced concrete and structural iron construction.

Milwaukee

MILWAUKEE, WIS., September 12, 1910.

Recent contracts taken in the more remote districts of the United States, British Columbia, Alaska and Mexico, by representatives of several of the larger machinery builders here have brought enough work to local shops to materially swell the expected volume of fall production, and the effect is visible in preparations now being made for an enlarged output. From the industrial centers of the East and Central West few orders of any consequence have been secured lately, but there is a good deal of business in sight, and the situation is nowhere discouraging. The South is also offering better opportunities than for some time past and inquiries from the Southwest, especially Oklahoma, show a decided increase.

Foundries, machine shops and other manufacturing plants that cater to the automobile industry are feeling the effect of the present comparative dullness in that line. In some cases working forces have been curtailed. This condition is, however, not expected to last very long, for, while there has been a great deal of talk concerning lessened production on the part of the principal motor car manufacturers, the new plants that are coming into the field, together with the growth of numerous small concerns, can hardly fail to provide even more work than last year. In Wisconsin the increase of commercial vehicle building will alone afford an appreciable outlet for auto machinery parts.

Shipments abroad have been quite liberal during the summer, and there is a tendency on the part of Wisconsin manufacturers to extend their trade in foreign countries. South America is being particularly looked to for business of a certain class, but even in Europe some good sales have been made by local machinery builders who are represented there.

The new power plant of the Algomah Mining Company at Houghton, Mich., on the upper peninsula of Michigan, including boilers, feed water pump, hoisting engine, air compressor, &c., is near completion, and from this time on development work will be actively prosecuted. The purchase of some additional equipment will be necessitated during the fall and winter months.

The Dornfeld-Kunert Company, Watertown, Wis., is very successfully introducing a type of gas producer which generates a gas free from impurities and is very simple in operation, there being automatic air and water vapor control for different loads and no valves to adjust. Included in the design are also other features of interest that have attracted a great deal of attention from power users in this part of the country.

A new factory is to be erected at Reedsville, Wis., by the Wisconsin Pea Canners Company. Power and operating machinery will be required.

Foster superheaters, manufactured by the Power Specialty Company, 111 Broadway, New York, have come very largely into use in connection with Milwaukee built machinery for electric power plants, particularly steam turbines, the efficiency of which they undoubtedly increase materially when an installation is considered as a whole. Present tendencies seem to lie more than ever in the direction of superheated steam for plants in which operating economy is a factor, and the market for apparatus such as that above mentioned is gradually widening.

The size of the factory to be erected by the Helvetia Milk Condensing Company at New Glarus, Wis., has been decided upon as 180 x 240 ft., and building contracts are now being let. The company's main office is at Highland, Ill.

In spite of delays attendant upon slow deliveries of material, stormy weather, &c., the work on the new plant of the Kempsmith Mfg. Company, Milwaukee, at the site recently secured in West Allis, is now progressing at a very rapid rate under the stimulus of a large construction force. The pattern shop has been erected, the machine shop and power plant are well under way and the foundations for the boilers, engine, generator, &c., are being prepared. It will not be long now before the company is in a position to undertake the largely increased production which the present demand for its milling machines necessitates.

Two new hoisting engines built by the Nordberg Mfg. Company, Milwaukee, are being installed on the property of the Miami Copper Mining Company, at Globe, Ariz. One of these is of large capacity, to be used for handling ore, and the other will serve the men employed in the mine.

One of the docks of the Great Northern Railway Company, at Superior, Wis., which is under lease to the Philadelphia & Reading Coal Company, is to be thoroughly modernized, and new electrically operated rigs for handling installed.

L. R. Felder has opened an office in Milwaukee, at 202 Majestic Building, for the sale of the products of the Chicago Pneumatic Tool Company, Chicago, Ill.

Funds for the purchase of an electric power and lighting plant have been voted at Sun Prairie, Wis.

One of the products of the Western Malleable & Gray Iron Company, Port Washington, Wis., is a line of gasoline engines ranging in size from 1½ to 15 hp., which are designed to be portable, and have come into quite extensive use for operating farm machinery, &c.

J. W. Robisch, who is building a large automobile garage at Jefferson, Wis., will install a machine shop for repair work in connection with it.

The Allis-Chalmers Company, Milwaukee, is building in its shops here a 20,000,000 gal. pumping engine for the city of Wheeling, W. Va.

An election is to be held at Walworth, Wis., to determine whether a pumping plant will be installed by the city.

The Freeman Zinc Company, Montfort, Wis., is planning to erect a new ore reduction plant by or before spring.

Changes in the water system at Ripon, Wis., which may involve the purchase of new pumping machinery, are being considered by the authorities there.

A three-story addition, 26 x 100 ft., is to be made this fall to the factory of the Western Grip & Trunk Company, Milwaukee.

The Racine Stool Company, Racine, Wis., has purchased the property on which its factory is located and has awarded contracts for the construction of two additional stories to its present factory building.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is erecting an addition to its power plant 80 x 144 ft., at a cost of $80,000, and a substation 40 x 57 ft., at a cost of $25,000. Contracts have been placed for General Electric turbo generator units and Edge Moor boilers which will be installed upon completion of additions.

The Harvey Spring Company, Racine, Wis., is having plans prepared for a one-story factory building, 100 x 400 ft.

St. Louis

ST. LOUIS, September 12, 1910.

THE MISSOURI PACIFIC RAILWAY COMPANY'S LIST.

The general purchasing agent of the Missouri Pacific Railway Company, St. Louis, Mo., is receiving prices on the following list of tools, for delivery f.o.b. St. Louis:

Two horizontal boring machines, motor driven.
Two 84-in., two 51-in., three 37-in. vertical boring and turning mills, motor driven.
Two 84 x 48 in. by 18 ft. planers, with four heads, motor driven, with double belt drive.
Six 36 x 36 in. by 12 ft. planers, motor driven, with double belt drive.
Two 36 x 36 in. by 10 ft. planers, motor driven, with double belt drive.
Two 5 ft. 6 in. universal radial drills, motor driven.
Two 5-ft. semi-universal radial drills, motor driven.
Eleven 42-in. drill presses, motor driven.
One 28-in. drill press, belt driven.
Four sensitive drill presses, 15-in.
Three 90-in. wheel lathes, motor driven, with independent journal turning attachment, complete set of patented driving dogs, single quartering attachment and face plates recessed for long crank pins.
Two 42-in. steel tire turning lathes, with patented driving dogs, motor driven, tailstock to have power movement.
Three 30-in. by 14-ft. engine lathes, motor driven.
Two 28-in. by 12-ft. engine lathes, with taper attachment, motor driven.
Four 24-in. by 10-ft. engine lathes, motor driven.
Four 20-in. by 8-ft. engine lathes, belt driven.
Two 18-in. by 12-ft. engine lathes, with taper attachment, belt driven.
Eight 18-in. by 8-ft. engine lathes, belt driven.
Two 2-in. hollow spindle turret lathes, belt driven.
Four 18-in. brass turret lathes, belt driven.
Three 16-in. by 6-ft. toolroom lathes, belt driven.
Four 16-in. by 6-ft. bolt lathes, with two-step cone, belt driven.
Two 16-in. by 6-ft. motor driven portable bolt lathes.
Two 32-in. railroad draw cut shapers, motor driven.
Four 24-in. heavy duty back geared shapers, motor driven.
Three 15-in. slotting machines, motor driven.
Two universal milling machines, belt driven.
Two double emery grinders, for 20-in. diameter wheels.

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Two No. 2 universal tool grinding machines, 12 x 30 in., belt driven.
Five emery grinders, belt driven.
Three new twist drill grinders.
Three grindstones, 48 x 8 in., on wheels.
Two 100-in. 600-ton hydraulic wheel presses, motor driven.
Two 1½-in. double bolt cutters, with power feed and lead screw, motor driven.
Two No. 2 hack saws, belt driven, with 12-in. blade.
Three portable boring bars, 4½-in. bar 8 ft. long, with attachments for boring piston valve chambers.
Two valve facing machines with 22-in. disks, to finish 25 in. across corners.
Two No. 2, 1 to 4 in. pipe machines, motor driven.
Two combination centering and drilling machines, capacity ⅛ to 4 in.
Two special 2000-lb. single frame steam hammers, with guided rod, 45-in. stroke, 36 in. from center of dies to frame.
Two 800-lb. single frame steam hammers.
Two 2-in. heading, upsetting and forging machines, belt driven.
Two 2-in. double bolt cutters, with power feed, motor driven.
Three blowers, motor driven.
Two single spring tempering furnaces, oil burning.
Two oil burning case hardening furnaces.
Two oil burning bolt furnaces.
Two oil burning forging furnaces.
Twenty anvils, 400 in. each.
Twenty-five blacksmith forges, 48 x 48 in.
Two 36-in. automatic cut-off saws, belt driven.
Three rip saws, without self-feed, without countershaft, with saw, belt driven.
Two 36-in. band saws, belt driven.
Three hollow chisel mortisers, with single boring attachments, belt driven.
Two electric motors, 15 hp., 725 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 5 hp., 975 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 30 hp., 1025 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 7½-hp., 975 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum speed release starting rheostat.
Two single punch and shears, 20-in. throat, to punch 1¾ in. diameter through 1⅜ in. steel, to shear 2¼-in. round iron, belt driven.
Two single shears, 48-in. throat, to shear 1-in. plate and punch 1¼-in. diameter in 1-in. plate, motor driven.
Two oil burning flue welding furnaces.
Two flue welding machines, belt driven.
Two flue cutting machines.
Two single punches with 48-in. throat, to punch 1¼-in. diameter through 1-in. plate, to shear 1-in. plates, motor driven, with jib cranes mounted on top.
Two plate bending rolls, No. 2 machine, 10 ft. 2 in. between housings, motor driven.
Four forges, 48 x 48 in.
Two light power single punches, 24-in. throat, with shearing attachment complete, belt driven.
Four boiler makers' lever forges, No. 82.
Seven anvils, 400 lb. each.
Two flue cutting apparatus with No. 2 cutter, without motor.
One 28-in. drill press, motor driven, with geared motor drive.
One 36-in. automatic cut-off saw, belt driven.
Two 15-hp. induction motors, complete with sliding bed plate, pulleys and auto starter, 710 rev. per min., 220-volt, 25-cycle, three-phase.
One 30-hp. induction motor, complete with sliding base, pulley and auto starter, 1430 rev. per min., 220-volt, 25-cycle, three-phase.
One 7½-hp. induction motor, complete with sliding base, pulley and auto starter, 705 rev. per min., 220-volt, 25-cycle, three-phase.
One 3500-lb., one 2500-lb. and one 1100-lb. single frame steam hammers.
One 300-lb. belt driven rubber cushioned bevel hammer.
One 5-in. universal forging machine, motor driven.
One 2-in. heading, upsetting and forging machine, belt driven.
One 32-in. draw cut shaper, motor driven.
One 5-ft. semi-universal radial drill, motor driven.
Three 16-in. by 6-ft. bed bolt lathes, with two-step cone, belt driven.
One four-side timber planer and sizer, 14 x 24 in., with 100 hp. D. C. motor.
One No. 3 pipe machine, 1⅛ to 6 in., motor driven.
One chain mortiser, for cabinet shop and sash and door work.
Three 24-in. heavy duty back geared shapers, motor driven.
One 32-in. draw cut shaper, motor driven.
Three 42-in. vertical boring and turning mills, motor driven, with two heads.
One 37-in. vertical boring and turning mill, motor driven, with two heads.
Two 24-in. by 12-ft. bed engine lathes, belt driven, one to have taper attachment.
Three bolt driven lathes, 16-in. by 6-ft. bed, with two-step cone, belt driven.
One 5-in. semi-universal radial drill, with motor drive.
One double emery grinder, motor driven, for 20-in. diameter wheels.
One 1½-in. double bolt cutter, with power feed and lead screw, motor driven.
Two No. 2 improved brass turret lathes, belt driven, back geared.
One sensitive drill press, 15-in.
One 72-in. plate bending rolls, motor driven.
One double punch and shear, 36-in. throat, motor driven, arranged with radial crane mounted on top.
One pneumatic clamp, 10-ft.
One 800-lb. steam hammer, single frame.
One 1500-lb. single frame steam hammer.
One 36-in. band saw.
One 3500-lb. double frame steam hammer.
One 100-lb. single frame steam hammer.
One 300-lb. belt driven rubber cushioned bevel hammer.
One 32-in. railroad draw cut shaper, motor driven.
One turret lathe.
One 28-in. turret lathe.
One 50-hp. motor, 220 volts, D. C., constant speed, shunt wound, with low voltage release starting box.
One special 1500-lb. single frame steam hammer.
One 24-in. heavy duty back geared shaper, belt driven.
Two 16-in. by 6-ft. bolt lathe, with two-step cone, belt driven.
One 30-in. by 14-ft. bed engine lathe, with taper attachment, belt driven.
One four-side timber planer and sizer, 14 x 24 in., belt driven.
One 42-in. vertical boring and turning mill, belt driven.
One flat head turret lathe.
One 300-lb. belt driven rubber cushioned hammer.
One 42-in. vertical boring and turning mill, with two heads, belt driven.
Two 16-in. by 6-ft. bolt lathes, with two-step cone.
Three 42-in. vertical boring and turning mills, belt driven.
Two 16-in. by 6-ft. bed engine lathes, with two-step cone, belt driven.
One 42-in. drill press, belt driven.
One 36 x 36 in. by 12 ft. planer, with three heads, belt driven.
One 36-in. by 14-ft. bed engine lathe, with taper attachment, belt driven.
One 24-in. heavy duty back geared shaper, belt driven.
One 36-in. band saw, belt driven.
One No. 310 automatic hollow chisel mortiser, with single boring attachment.
One 800-lb. single frame steam hammer.
One 36-in. band saw, belt driven.
One No. 5 punch, size O, hand power, capacity ⅝ in. for ½-in. plate, 36-in. throat.
One hand power shear, capacity ½-in. plate.
One hand power punch, capacity ⅝ in. for ½-in. plate, 36-in. throat.
One hand power shear, capacity ½-in. plate.
One straight line air compressor, capacity 200 cu. ft. of free air per minute, air pressure 100 lb. per square inch.
One band saw, inclosed type, belt driven.
One heavy duty back geared shaper, 24-in., belt driven.

The Webb Motor Fire Apparatus Company and the Robinson Fire Apparatus Company are both quite busy. The former concern gives its exclusive attention to automobile fire engine outfits and the latter is also devoting much time to this new branch of the industry.

The Lemp Brewing Company has been making some extensive improvements in its plant, including a new boiler house, which is now practically complete.

The Duplex Adding Machine Company has been purchasing new equipment from time to time to keep pace with its growing business.

The Commonwealth Steel Company has under way a new section of building to further increase its foundry floor capacity.

Smith & Davis Mfg. Company, maker of metal bedsteads, &c., now operates a modern foundry for its own exclusive use, the growth of business having made this necessary.

The Wagner Electric Mfg. Company, which is becoming one of the large industries of this section, finds the demand for its single phase motors, &c., particularly heavy, and all other departments of the plant are also well occupied.

The Williams Crusher Company placed an order last week for a heavy milling machine.

The Hall & Brown Woodworking Machinery Company is making some changes in its equipment and among recent orders placed was one for a Kempsmith miller.

A tornado swept the Joplin district September 4, entailing heavy property damage. Galena, Kan., and the country surrounding bore the brunt of the storm and 10 mining plants were destroyed, causing a loss of upward of $150,000.

The St. Louis County Gas Company has purchased 44 acres of land at Shrewsbery Station and will erect a plant on the site which will have a capacity of 730,000,000 ft. a year, and they will also have a storage container with a capacity of 1,000,000 ft.

During the present month the erection will be commenced of the buildings at Ottumwa, Iowa, to be occupied by the Ritchie Corrugated Culvert Company. The track connecting with Chicago, Milwaukee & St. Paul Railroad is now in course of construction.

The Central Tire Company will occupy a new factory to be built at Marshalltown, Iowa, for the manufacture of steel and leather tire protectors for automobiles. F. L. Randall of Boulder, Colo., is superintending the establishment of this new company at Marshalltown.

The new Mercer Wheel factory at Burlington, Iowa, which was begun in May has been completed and has been started up and within a few weeks everything will be in thorough order.

The city of Jacksonville, Ill., is advertising for bids for all the material and labor and erecting and installing a pumping plant for the city. Sealed bids will be received up to September 19.

The American Gypsum Company will erect a plant to cost $100,000, on property located near Nashville, Tenn., on the Memphis, Dallas & Gulf Railroad, three miles south of Murfreesboro. The property is known as "plaster bluff" and the company's products will be plaster, fertilizers, &c.

The Appalachian Marble Company, Knoxville, Tenn., will erect a new mill at Concord, Tenn. The company, which was recently incorporated, has secured the plant of the Tennessee Marble Company at Concord.

Mrs. Dakotak Ryan, Leavenworth, Kan., will largely increase the capacity of her ice plant on South Second street. The plant has now a capacity of 75 tons a day. Mrs. Ryan has asked for proposals for machinery sufficient

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to manufacture 150 tons. The cold storage warehouse has now a capacity of 10,000 barrels and it is proposed to increase it to 30,000.

Workmen have begun the erection of the Parker carnival equipment factory on South Fourth street, Leavenworth, Kan. J. V. Kelly is the agent for the company

The Beacon Mining Company, Franklin Playter, president, is contemplating the erection of a 200-ton mill near Galena, Kan. The company has installed a large centrifugel pump in an old shaft and will sink another and deeper shaft nearby.

The Woodcock Mfg. Company, Vinita, Kan., with a capital stock of $20,000, has been granted a charter. The incorporators are J. C. Woodcock, Marshall Stevens, C. W. Day and others.

The Ferguson & Wheeler Handle Company, Marked Tree, Ark., leased and operated by Turner & Hirschmann, burned September 1, entailing a loss of about $50,000.

The Goliad Water & Light Company, Goliad, Texas, is negotiating for an ice plant to be placed in operation next season.

An extensive pumping plant, costing $130,000, will be erected at Eagle Lake, Texas, which will insure the rice-growing section the greatest pumping plant on the Colorado River. The parties interested in the enterprise are as follows: W. T. Eldridge, Sugarland, president; John Lane, Houston, vice-president; John Roeger, Eagle Lake, consulting engineer.

The Center Light & Ice Plant, Center, Texas, will make extensive improvements in its machinery. The capital stock has been increased $20,000. The purpose is to increase the productive capacity of the plant by the introduction of larger machinery, thus enabling the operation of fans and electric motors at all points on the line and supply nearby towns.

G. A. Mellon, 3505 Pine street, St. Louis, Mo., is having plans prepared for a four-story factory building, 130 x 150 ft., which will be occupied by the Regal Buggy Company when completed.

The Automatic Register Company, East St. Louis, Ill., will shortly build a plant at East St. Louis for the manufacture of an automatic passenger indicator for attachment to electric street cars and passenger trains, which will indicate mechanically the exact amount earned by the car. The company has offices in the Metropolitan Building, East St. Louis.

The Missouri Pacific Railroad Company, St. Louis, Mo., is building a locomotive repair shop at Kansas City. The shop will be 153 x 334 ft., and it is estimated it will cost about $136,000.

C. E. Osborn, Alton, Ill., is arranging to incorporate a company to manufacture motor cycles. It has not been decided just where the plant will be located.

The Southwest

KANSAS CITY, MO., September 12, 1910.

It is reported from a number of points that dealers in machinery who have been handling stocks on consignment and were planning on accumulating standard lines this fall for prompt delivery are finding difficulty in carrying out that arrangement, as the builders prefer to ship directly from their factories on individual orders, leaving in the hands of agents only enough apparatus to serve as samples. Just how far there is a tendency on the part of Eastern houses to alter existing customs of the trade it is at present impracticable to state, but conditions are evidently changing to some extent, and the coming season will probably witness a readjustment of many established relations. Quite a number of the larger manufacturers now have their own warehouses at the various trade centers, and it is known that others contemplate building them. District stocks of power and electrical machinery, pumping outfits, gasoline engines, &c., are especially to be increased, and in many instances they will be directly under the control of branch office managers employed by the manufacturers themselves.

Business throughout the Southwest is quietly but steadily improving. Orders for equipment of all kinds follow more closely upon inquiries than they have at any time since last spring, and there is very little haggling over prices. Municipalities are still among the heaviest buyers, with mining companies, timber cutting and woodworking concerns next in line. Sheet metal and fabricating plants will be improved to a considerable degree during the fall, and for many foundries and machine shops replacements or extensions are contemplated, but in these lines buying is not likely to be very brisk until a little later on, except as recently noted.

The contract for installing a new filtration plant has been placed by the Newport Water, Light & Power Company, Newport, Ark., with the Roberts Filter Mfg. Company, Philadelphia, Pa.

Large crushing rolls built by the Taylor Engineering Company, Allentown, Pa., of which there are two sets, and eight sets of fine crushers from the shops of the same company, are being installed in the new concentrating plant of the Miami Copper Mining Company, Globe, Ariz. These are in addition to similar equipment previously used.

A new boiler will probably be furnished this fall for the municipal plant at Shelbina, Mo., which has a capacity of 200 hp. The present equipment was furnished by the Springfield Boiler & Mfg. Company, Springfield, Ill.

The Moore Mfg. Company, whose headquarters are now at Springfield, Mo., will remove machinery to Mammoth Springs, Ark., and remodel mill buildings there for its purposes, if the arrangement recently made with the commercial interests of that place is carried out. It is proposed to use electric power. This concern has at present one of the largest furniture factories in the Southwest.

With the sale of bonds recently issued for the purpose, equipment for an electric plant to be operated by the municipality will be bought at Coleman, Texas.

A new crushing and pulverizing plant, equipped with heavy gravity stamps, tube mills, &c., will be built at Rosedale, near San Marcial, N. M., by the Rosedale Mining & Milling Company, to replace the mill that recently burned.

The Scott Mfg. Company is putting in a new woodworking plant at Helena, Ark. The machinery has been provided, but additional equipment will be needed later.

Plans for the replacement of the power and pumping station recently destroyed by fire are being worked out at Belleville, Kan.

It is the intention of the Salina Light, Power & Gas Company, recently organized at Salina, Kan., by G. H. Smedley and others, to build a gas plant and an electric power and lighting station with which to supply the city, local industries, &c.

The Hackett Mining Company, Joplin, Mo., is installing machinery in a new concentrating plant, which has been especially constructed after the designs of Prof. R. H. Richards of the Massachusetts Institute of Technology, Boston, Mass.

The city of El Paso, Texas, will take bids until September 20 on a refuse incinerator and sewage disposal plant of 30 tons and 3,000,000 gal. daily capacity.

The Missouri Valley Bridge & Iron Company, St. Louis, has been awarded the contract for 24 bridges to be erected for the county in which Okemah, Okla., is located.

A new pumping engine and air compressor for boosting the pressure in the city mains will be installed this fall at Floresville, Texas.

Machinery for a new mill will be installed within the next two months at Benton, Ark., by the Greenville Stave Company, Greenville, Ark.

Arrangements are being completed for the erection of an ice plant of 60 tons capacity to be operated in connection with the Arkadelphia Milling Company, Arkadelphia, Ark. F. Noland of the milling company will be one of the principal stockholders of the company, which will have $25,000 capital.

The Wichita Railroad & Light Company, Wichita, Kan., is having plans prepared for the erection of railroad shops and car barns to be erected at a cost of about $35,000.

The plant of the Belleville Light & Power Company, Belleville, Kan., which was destroyed by fire at a loss of $35,000, will be rebuilt.

The Bailor Plow Company has been organized at Atchison, Kan., to manufacture plows, planters, hay tools and other agricultural implements. The company has taken possession of existing plants, which will be equipped with new machinery and will require no power or transmission equipment. The officers and directors are: President, Henry Clostermeir; vice-president, S. E. Bailor; secretary and treasurer, T. R. Clendinen; P. B. Wagner, C. A. Lierboe.

The Pacific Coast

SEATTLE, WASH., September 9, 1910.

A great deal of interest is being taken here this week by local commercial firms, including men engaged in the iron, steel and machinery trades, in the return from Alaska of Secretary Nagel and Attorney-General Wickersham, who, with Secretary Ballinger, recently expressed a desire to confer with representatives of business on the north coast concerning the possibilities of that territory when properly opened up to industrial development, as well as the best means of effecting the latter. The quantity and increasing variety of the equipment and supplies ordered this season for established industries or development enterprises in Alaska, together with the publicity given the controversy over coal land entries, has opened the eyes of people here to the importance of the question and its bearing upon the

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market for the products of the plants of this section. Henceforth it will be given proper consideration.

The new car shops of the Chicago, Milwaukee & Puget Sound Railway at Tacoma, Wash., which are among the best equipped of any in the United States, are now in full operation, and the repair work for the company's Western lines will be done there. This creates another large and regular customer for the machinery and supply houses of the north coast, and the disposition of the road will be to buy as much of its material as possible from manufacturers and dealers in this section.

In connection with their operations near Arlington, Cobb & Healy, Everett, Wash., are building a machine shop 50 x 125 ft., which will be equipped for heavy work.

It is reported from Loon Lake, Wash., that an electric power plant and water works are to be installed there by Gherke & Sons.

The International Lead & Iron Company, recently organized, of which H. H. Shallenberger, Spokane, Wash., is secretary, has established an office there in the Columbia Block. Plans are now being made to develop lead and hematite iron ore properties in British Columbia. It is proposed to establish blast furnaces and to build a pipe foundry and car wheel plant. Power is to be derived from a hydroelectric development, which is being independently completed at a point near the company's operations.

The Stetson-Ross Machine Works, Seattle, Wash., is introducing among the woodworking plants of the north coast a fast feed outside matcher which is notable for the simplicity of its design when considered in connection with the large output that it renders possible.

The Willapa Harbor Iron Works, South Bend, Wash., is finding one of its best selling lines in the production of jacks, of which it manufactures the Hercules type,

Repairs and improvements will be made in the plant of the Seattle Car Mfg. Company, Renton, Wash., a portion of which was recently visited by fire.

The expenditure of a large sum for remodeling and extending the local water works system is proposed at Snohomish, Wash.

The Alaska-Treadwell Company, Juneau, Alaska, is preparing to complete a large hydroelectric plant in the vicinity of its mines. The water right, however, has recently been contested by another company and this may delay the work.

The Oregon Railroad & Navigation Company has awarded contracts for the erection at La Grande, Ore., of a machine shop 132 x 132 ft. and a blacksmith shop 65 x 95 ft., to cost $160,000.

The Phoenix Iron Works, Portland, Ore., is erecting a two-story frame foundry building 88 x 130 ft., to take the place of its present foundry. The company has a full equipment but expects to install an electric traveling crane in the near future.

The Smith & Watson Iron Works, Portland, Ore., is building a forge shop which will be equipped with modern machinery, including forging presses, oil furnaces, &c.

The Baker-Smith Machine Company has been organized to take over the affairs of the Baker Machine Company, manufacturer of gasoline marine engines, of San Diego, Cal. The company will be expanded by the erection of a foundry and will make a specialty of manufacturing engines of from 3½ to 12 hp. The company is also agent for the Eastern Standard engine and has assumed the California agency of the Pierce Motor Company, Racine, Wis.

The Northwest

MINNEAPOLIS, MINN., September 12, 1910.

Trade during the past week has been about normal for this time of the year, but to those who looked for a general resumption of buying early in September the situation is disappointing. Events attendant upon Mr. Roosevelt's visit, the Conservation Congress, primary elections, State fairs, local expositions, &c., have occupied public attention to a greater extent, it seems, than in any former year, and business is slow in settling down to any definite autumn policy. A general spirit of unrest is also manifested, which makes it difficult to predict what the immediate future of the market will be. Dealers in the leading trade centers are having a fair run of orders, and in the local metal working industries shops are busy on routine work, including repairs, plate work, iron and steel fabricating for various purposes and the production of special machinery to order. Bookings on these accounts are made for enterprises at considerable distances, as well as the ones nearer home.

The capacity of the municipal power plant at Alexandria, Minn., which is now equipped with engine driven generators built by the General Electric Company, Schenectady, N. Y., will be increased by the purchase of an additional unit.

The city authorities at Preston, Minn., have under consideration plans for the construction of a hydroelectric power plant of about 200 kw.

The Coeur d'Alene Iron Works, Wallace, Idaho, which were visited by the recent conflagration there, will be rebuilt for larger capacity and equipped with the most modern machinery electrically operated. Meanwhile, temporary arrangements will be made to take care of the large business which is done by this company in furnishing mining equipment and supplies.

Pumping machinery for Ft. Missoula, Mont., will be built in the shops of the Anaconda Copper Mining Company, at Butte, Mont.

A bond issue to the amount of $30,000 has been authorized at Fairmont, Minn., for the purpose of enlarging the electric power plant, which is at present equipped with alternating current generators of 175 kw., driven by gas engines of the Minneapolis Steel & Machinery Company's build. The extension of the city pumping and water works system is also contemplated.

J. B. Thompson has been granted the franchise for an electric lighting plant at Gilbert, Minn., and is expected to purchase machinery for it in the near future. A battery of boilers, Corliss engine and alternating current dynamo will probably be among the requirements.

The Northern Welding & Mfg. Company, Minneapolis, which has the Northwestern agency for the Davis-Bournonville Company, is installing quite a number of private plants for oxy-acetylene welding, besides doing custom work in repairing broken castings of any size, whether steel, cast iron, aluminum, brass, bronze or any other metal. The outfit furnished is one that enables large factories or mills to do their own repairing, thus not only saving in the expense for the work, but also obviating long and costly delays in operation due to the breakage of vital parts of machinery.

Improvements in its large dock at Duluth, Minn., which include the installation of modern electrically operated handling machinery, will be made by the St. Paul & Western Coal Company, whose headquarters are in St. Paul.

The construction of an electric power plant to be owned and operated by the community is proposed at Bowdle, S. D., but no definite steps to that end have as yet been taken.

The Power Equipment Company, Minneapolis, now maintains a complete machine shop for manufacturing and job work. It is prepared to undertake repairs of any kind, from rewinding electrical machinery to boring engine cylinders or other similar service.

The construction of a water works system has been definitely decided upon at Harlowton, Mont. Purchase of equipment will be considered at some time during the fall and early winter.

The city of St. Paul has ordered two new pumping units with a combined capacity of 25,000,000 gal.

The citizens of the village of Marble, Minn., will vote on the question of issuing $30,000 in bonds for the construction of a water works system.

The Northwestern Insulation Company, St. Paul, Minn., recently organized, has plans prepared for the erection of a factory building, 65 x 240 ft., and a boiler house, 60 x 70 ft.

The White Track Laying Machine Company, Foley, Minn., has filed articles of incorporation with $150,000 capital stock. The company will manufacture a track laying machine, of which J. White of Foley is the inventor, and operations will be commenced as soon as the organization of the company is completed.

The Farther Central West

OMAHA, NEB., September 12, 1910.

Purchases of boilers, pumps, heaters and auxiliary apparatus for power and heating plants have constituted a feature of trade thus far this month, and more buying on this account will be done within the next few weeks, as there is a rush now to get such plants in shape for operating by the time cold weather sets in. For many private plants and large public buildings other mechanical equipment, such as ventilator fans, motors, electric elevators, air compressors, &c., are needed. Fabricated metal is also largely wanted, both for ordinary structural and ornamental purposes, and the shops supplying that class of trade are very busy. In the line of general machinery for factories, mines, contractors' service, &c., the situation is as previously reported, trade being fairly steady but showing no marked gains. Very little machine shop or foundry equipment is being ordered.

An order for two steam turbine generating units of 1000 kw., with condensers, exciters, transformers, switchboard, &c., has been placed by the Federal Light & Traction Com-

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pany, Denver, Colo., with the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

An additional substation will be built and equipped in the near future by the Nebraska Traction & Power Company, Omaha, Neb. Included in the plans for betterments is also a new forge and machine shop for repair work.

The Salt Lake City office of the Allis-Chalmers Company, Milwaukee, has closed a contract for machinery to be used in connection with tungsten mining near Osceola, Nev., carried on for the account of O. E. Turner, Philadelphia, Pa. The comparatively rare occurrence of this mineral renders the installation an unusual one and its operation will be watched with considerable interest.

Machinery for the new electro-chemical ore reduction plant of the Western Metals Company, Georgetown, Colo., which has been principally furnished by the General Electric Company, Schenectady, N. Y., is now being installed. The operation of this mill will be watched with a great deal of interest, and if successful it will lead to the use of a good deal of similar equipment by others.

The Gade Bros. Mfg. Company, Iowa Falls, Iowa, which was one of the earliest concerns in this part of the country to put gasoline engines on the market in any commercial quantities, has brought its present design to a high state of efficiency and operating economy.

The Standard Bridge Company, Omaha, Neb., has been intrusted with the building of a new steel bridge at Spearfish, S. D.

The Ft. Dodge, Des Moines & Southern Railroad, Ft. Dodge, Iowa, has decided upon the installation of transformers and two rotary converters of 400 kw. each in a substation to be erected this fall. Westinghouse machinery will be specified.

The Armstrong-Quam Mfg. Company, Waterloo, Iowa, is rapidly extending its trade in portable drilling machines, and for the coming season a larger output will be necessitated. An interesting feature in the construction of this apparatus is the fact that in the special machines for rock work the drilling motion is obtained by the use of elliptic gears rolling in contact.

Plans are being completed for modern shops of steel construction to replace the factory of the Ottumwa Box Car Loader Company, Ottumwa, Iowa, which was destroyed by fire. The details of the new equipment required have not yet been fully worked out.

It is reported there that a large new factory will be built in Omaha by the V. S. Segerstrom Piano Company, Minneapolis, Minn., as the result of an arrangement recently entered into with the new industries committee of the Omaha Commercial Club.

A new electrically operated plant is to be built at Ft. Dodge, Iowa, by the Corn Belt Packing Company.

The contract for constructing a bridge at Lingle, near Cheyenne, Wyo., has been awarded the Pueblo Bridge Company, Pueblo, Colo.

The property of the Warm Springs Iron Works Company, Salt Lake City, Utah, has been sold by order of Judge M. L. Ritchie to Joseph A. Silver of Salt Lake City for $19,800.

The John Z. Evans Mfg. & Supply Company, Albia, Iowa, incorporated with $20,000 capital stock, is having plans prepared for a factory building, the contract for which will be awarded in the near future. The officers of the company are John Z. Evans, president; P. H. Hynes, vice-president; T. B. Dotts, treasurer; Wm. Powell, secretary. The company will manufacture mining machinery.

The city of Blue Hill, Neb., will expend $8000 for the construction of an electric light plant.

Government Purchases

WASHINGTON, D. C., September 12, 1910.

The Bureau of Yards and Docks, Navy Department, will open bids October 1 for completing power plant at the United States Naval Academy, Annapolis, Md.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 27, under schedule 2901, for four direct current motors, and on October 4, under schedule 2890, for 30 generators, and under schedule 2905, for one air compressor.

The Bureau of Supplies and Accounts, Navy Department, opened bids September 6 for the following:

Class 32, two turbo generating sets, one motor generating set and switchboard.—Bidder 2, the Bradley-Reese Company, Baltimore, Md., $9560; 48, the General Electric Company, Schenectady, N. Y., $11,900; 116, the Carey Steam Turbine Company, New York, $11,978.

Class 121, one combination paint grinding mill and varnish cutter.—Bidder 77, Manning, Maxwell & Moore, New York, $377; 99, the Charles Ross & Son Company, Brooklyn, N. Y., $550.

An Export Association Formed

The American Manufacturers' Export Association was organized at the Hotel Imperial in New York City September 12. Manufacturers whose capital aggregates more than $250,000,000 were represented by their export managers or other officials. The number actually present was about 50, though the meeting by voice, letter or telegram represented 160 American manufacturers. The officers elected are as follows:

President, W. B. Campbell, secretary Perkins-Campbell Company, Cincinnati, Ohio; first vice-president, J. K. Rodgers, E. I. du Pont de Nemours Powder Company, Newburgh, N. Y.; second vice-president, D. P. Mitchell, Victor Talking Machine Company, Camden, N. J.; third vice-president, D. E. Delgado, Eastman Kodak Company, New Haven, Conn.; directors, I. S. Betts, National Cash Register Company, Dayton, Ohio; E. H. Allen, C. A. Edgarton Mfg. Company, Shirley, Mass.; S. S. Weart, Sun Vapor Light Company; Alfred F. Howe, the Borden Company; L. A. Kimball, Simonds Mfg. Company, Fitchburg, Mass., and Maurice Coster, Westinghouse Electric & Mfg. Company and Westinghouse Machine Company, New York.

It is asserted by those who are back of the movement that patriotism no less than a desire to make more foreign business for American manufacturers is its inspiration, and that united action and interchange of experiences on the part of American shippers will do for American export trade what commercial organizations in Germany have done for German export trade in the last 10 or 15 years.

Sales Managers Visit Cleveland and Pittsburgh District Mills.—Members of the Chicago Managers of Sales Association, United States Steel Corporation, started from Chicago Tuesday night, September 13, on a tour of inspection of plants in the Cleveland and Pittsburgh districts. The Lorain, Ohio, mills of the National Tube Company and Lorain Steel Company, and the Cuyahoga and Newburg plants of the American Steel & Wire Company at Cleveland were visited Wednesday. Thursday and Friday were to be spent at Ellwood City, Ambridge, Vandergrift, Homestead, Monessen, McKees Rocks and Pittsburgh, Pa., at plants of various subsidiaries of the Steel Corporation, the schedule calling for arrival at Chicago Saturday morning.

Illinois Coal Strike Settled.—The strike of Illinois coal miners which began in April was settled September 8 on a basis which gives the men practically all they asked. The increase in Williamson and Franklin counties is 6 cents a ton and in the northern district 5 cents a ton. Day workers are given an increase of 5.55 per cent. The scarcity of coal due to the strike was beginning to affect a number of industries.

Owing to a scarcity of labor and a deadlock between the Grand Trunk Pacific and the British Columbia Government, which will not permit of the employment of Orientals, the contract for a large section of the new transcontinental is being held up. This may delay the completion of the Grand Trunk Pacific through British Columbia for two years.

Henry E. Pridmore, Chicago, manufacturer of molding machines, has received an order from the International Harvester Company for 34 stripping plate machines and one rockover molding machine for shipment to that company's plant now being erected at Lubertzy, Russia.

Obituary

ISAAC L. ELLWOOD

Isaac L. Ellwood died September 11 at his home in De Kalb, Ill. He was born at Salt Springville, Montgomery County, N. Y., August 3, 1833, and with the advantages of a limited common school education began to earn his own livelihood in early youth. Having driven a team on the Erie Canal and worked as a clerk in a store, he made his way to California in 1851, spending four years in that State, the first year working in the mines and subsequently being a salesman in a Sacramento store. Having accumulated a small capital, he established a hardware store at De Kalb, Ill., in 1855, carrying on the business for 20 years, combining with it the occupation of auctioneer. His daily contact with farmers brought to him a full knowledge of the conditions and opportunities which he was able to improve so well in later years.

When J. F. Glidden invented what is known to-day as the Glidden barb wire Mr. Ellwood assisted him in obtaining patents, securing a half interest in the invention. In 1876 Mr. Glidden sold his interest to the Washburn & Moen Mfg. Company, and that company, together with Mr. Ellwood, after a litigation of some years, granted licenses to various factories. At that early stage of the industry the selling price of barb wire was 18 cents per pound. Through Mr. Ellwood's influence and foresight all the underlying and first patents on barb wire and on machinery for making it were combined, enabling him, with the assistance of others, to build up one of the largest and most successful business enterprises in the history of the country. For a time Mr. Ellwood was associated with Mr. Glidden and afterward with the Washburn & Moen Mfg. Company in the manufacture of barb wire, but later he became exclusive owner and manager of the large establishment at De Kalb, doing business under the firm name of the I. L. Ellwood Mfg. Company, and also of another establishment of considerable magnitude at the same place known as the Ellwood Wire & Nail Company, engaged in the drawing of smooth wire and the manufacture of barb wire, nails and fence staples. In the course of time these interests became constituent parts of the American Steel & Wire Company, of which Mr. Ellwood was second vice-president and chairman of the Executive Committee until it was taken over by the United States Steel Corporation. Soon after this great consolidation Mr. Ellwood retired from active participation in the business.

Mr. Ellwood was always loyal to his home city of De Kalb, where he had resided continuously for 55 years. When his business was merged in the American Steel & Wire Company he insisted as one of the conditions of the merger that the large industries he had built up at De Kalb should be continued in full operation. A large part of his personal fortune was invested in farm lands in that vicinity, and he also had large holdings in Texas and other States. He was active in State politics, and in 1902 was appointed a member of the State Board of Railroad and Warehouse Commissioners. Through his efforts the Northern Illinois Normal School was located at De Kalb. He was married in 1859 to Miss Harriet Miller, who died July 16, this year. He leaves two sons and two daughters. The sons are William L. and E. P. Ellwood, both residing at De Kalb. He amassed a very large fortune, of which in recent years he divided the greater part among his children.

J. Franklin Robinson, Pittsburgh, died September 9, in Mercy Hospital in that city, aged 56 years. He was born in Wellsburg, W. Va., and went to Pittsburgh in his early manhood, entering the employ of his uncle, John H. Caughey, and later became a member of the iron firm of Caughey & Robinson, which afterward was succeeded by Robinson & Orr, dealers in rails and scrap material, now located at 421 Wood street. He was an active member of this firm until his death. He was actively identified with religious and benevolent organizations, especially the Young Men's Christian Association, of which he was a director for 36 years, and its president from 1886 to 1901. He was a member of the Duquesne Club, and a director and trustee of the Western Theological Seminary. He leaves a widow.

Edward W. Atwater, for many years president of the Johnston Harvester Company, Batavia, N. Y., and one of Batavia's most prominent citizens, died suddenly of heart disease September 2. He was born at Rochester, N. Y., in 1842, and entered the service of the Johnston Harvester Company in 1886.

Personal

James A. Sherwood, who for five years has filled a responsible position in the sales organization of E. S. Jackman & Co., Chicago, agents for the Firth-Sterling Steel Company, has been appointed Canadian agent for Thomas Firth & Sons, Ltd., Sheffield, England. He will take full charge of the Canadian trade of that firm October 1 and will establish his headquarters in Montreal.

R. E. Turnbull, who has been identified for a great many years with the firm of Henry E. Pridmore, Chicago, manufacturer of molding machines, as special representative in the middle Western territory, has been appointed sales and factory manager by Mrs. Pridmore, now at the head of the business.

J. Whitaker, 124 South Sixth street, Connellsville, Pa., formerly manager of the Connellsville Iron Works, is now engaged in business on his own account in furnishing structural steel and plate work and buying and selling new and second-hand boilers, pumps, and contractors' machinery of all kinds.

Ernst Wiener, president of the Ernst Wiener Company, New York, returned from Europe last week after an absence of several months on business.

The report that Frank McDonough, president of the McDonough Mfg. Company, Eau Claire, Wis., had become identified with the Smith & Watson Iron Works, Portland, Ore., is denied by the latter company.

N. T. Truschkoff, general manager of Blogodatny Mines and Smelters of Ekaterimburg Eral, Russia, is now in this country, to remain for 10 weeks, visiting various plants and manufacturers of mining equipment.

Joseph G. Butler, Jr., Youngstown, Ohio, president of the Bessemer Pig Iron Association and Chamber of Commerce of Youngstown and vice-president and general manager of the Brier Hill Iron & Coal Company, has returned from a four months' visit to Europe.

Leo G. Smith, formerly of the Bucyrus Steel Casting Company, Bucyrus, Ohio, and for some time connected with the steel foundry department of the Londonderry Iron & Mining Company, Ltd., Londonderry, N. S., has been appointed general superintendent of the Londonderry plant succeeding William Brown, resigned.

Charles F. Rand, New York, president of the Spanish-American Iron Company, has gone to Cuba and will spend the remainder of September at the company's iron mines in the Santiago and Mayari districts.

Chairman E. H. Gary of the United States Steel Corporation, who has spent the summer in Europe, will arrive in New York September 15.

C. H. M. Atkins, president of the Warner Elevator Company, Cincinnati, Ohio, returned last week from a four months' European tour.

The La Belle Iron Works' Annual Report

The annual report of the La Belle Iron Works, Steubenville, Ohio, presents the following income account for the year ending June 30, 1910:

Net earnings, after deducting $743,000 for repairs, &c.		$2,227,329.04
Less provision for mineral exhaustion, &c.		59,743.45
Profits for the year		$2,167,585.59
Deduct interest on bonds	$137,895	
Dividends paid	892,339	
		1,030,234.00
Surplus for the year		$1,137,351.59
Previous surplus		2,063,218.21
Total		$3,200,569.80
Less appropriation for depreciation		250,000.00
Net surplus		$2,950,569.80

The net surplus for the previous year was $877,563.73.

The balance sheet shows total current assets of $5,780,880.63, and total current liabilities of $560,819.61. In addition to the surplus above stated, the company carries $1,690,803.18 in reserve funds for general depreciation, exhaustion of minerals, extraordinary repairs, &c.

The production for the year as compared with the previous year was as follows:

	1909-'10.	1908-'09.
Pig iron, tons	209,461	130,898
Slabs and billets, tons	347,978	201,686
Plates and skelp, tons	271,783	165,625
Sheets, tons	41,468	36,598
Tubular goods, tons	70,782	51,532
Nails, kegs	194,682	187,722

The dividends paid during the year were at the rate of 8 per cent. per annum for the first two quarters and 10 per cent. for the last two quarters.

From President Isaac M. Scott's accompanying remarks to the stockholders the following extracts are taken:

"The year just closed was in many respects an unusual one, and to some extent disappointing. Twelve months ago the principal transportation companies of the country were making such headway in the shaping up of their finances as to justify them in purchasing equipment on a liberal scale. In fact, at that time the volume of railroad buying had again about reached normal conditions. This satisfactory situation on the part of the country's largest user of steel products, coupled with strong underlying business conditions generally, seemed to warrant the belief that the year 1910 would be an unusually prosperous one for those engaged in the manufacture of steel and steel articles, but during the last quarter of the calendar year 1909 disturbing questions of one kind or another, largely political, began to crop up with such frequency and were of so serious a nature as to render it almost impossible for the railroads to further market their securities, which it was necessary for them to do in order that they might take care of additional obligations. The outcome of all this has been a curtailment, reaching in some instances to almost a complete discontinuance of buying, not only of rails, cars and locomotives, but minor supplies as well. With this falling off in railroad buying, the demand for steel goods was reduced to a point where there was hardly sufficient to go round, prices suffering accordingly. The net result of these conditions has been to discourage the dealers and consumers generally from placing orders ahead, reducing the business to a hand to mouth buying basis, which is not conducive to good mill operations.

"Another disadvantage under which the company labored during the year was brought about by the radical advance in the price of coke, scrap and other like commodities, that took place during the last half of the calendar year 1909, and extending into the first quarter of this year. The advance in the price of materials which it was necessary to buy naturally had an unfavorable effect on the company's costs, and while the market price of finished articles responded to some extent, the advance in these was not in keeping with that shown in the raw materials, nor was the advance in the price of the former maintained for a sufficient length of time to enable the company to reap a proper benefit therefrom. In other words, the year's business suffered the disadvantage of higher costs without receiving a corresponding advantage in the way of increased prices for goods sold. Labor troubles also interfered with the year's business to an extent, but these, we are pleased to say, have now all been satisfactorily adjusted.

"In view of the experiences of the last year it is unsafe to undertake to foretell what may be expected during the coming 12 months, and it is, therefore, to be hoped that before matters go too far, and a good business situation thoroughly spoiled, something will develop to divert the attention of the political agitator, in order that his efforts may be devoted to a line of action which, if not really helpful in itself, may not be of a disturbing nature."

Rogers-Brown Barges on the Erie Canal

The Rogers-Brown Iron Company, Buffalo, N. Y., is planning the construction of a fleet of barges to operate on the present Erie Canal, and adapted also for the new and enlarged canal. The boats will be equipped for use on both salt and fresh water, and fitted with movable hatches, similar to the large lake ore boats. The tugs will have dynamos and electric cranes for handling pig iron to and from the docks, either with magnets or hook hoists as desired. The very latest design of coal-saving machinery will be used.

This new method of shipment will enable the Rogers-Brown Iron Company to make direct deliveries of its furnace products promptly to all points on the Erie, Oswego and Champlain canals, Hudson River, New York harbor, Newark Bay and nearby New Jersey points, East River and Long Island Sound.

The Pittsburgh Foundrymen's Association.—The first fall meeting of the Pittsburgh Foundrymen's Association was held in Engineers' Hall, Oliver Building, Pittsburgh, on the evening of September 12. J. C. Knoeppel of the Jones & Laughlin Steel Company gave a talk on cupola practice, illustrating it by a model of cupola and tuyeres. The meetings of this association will hereafter be held on the first Monday of each month at the above named place.

The Associated Foundry Foremen of Philadelphia and Vicinity have completed arrangements for their first annual dinner to be held at the Hotel Bingham, Philadelphia, on the evening of September 24. Among the speakers will be Rev. John R. Davies, D.D., Dr. Wilmer Krusen, Abram C. Mott, Hon. J. Hampton Moore and Mayor John E. Reyburn. Several novel features are promised in connection with the dinner which, from reports received by the committee, will no doubt be an elaborate affair.

F. E. Fieger, engineer, House Building, Pittsburgh, is taking estimates on the erection and equipment of the new steel plant to be built by the Whitaker-Glessner Company, at Yorkville, Ohio, near Wheeling. Two 60-ton open hearth furnaces, a blooming mill and a bar mill will be built. The steel produced will be consumed by the company's sheet mills at Wheeling.

The blast furnace of the Upson Nut Company, Cleveland, Ohio, was blown out September 3 for repairs and the installation of a pig casting plant. The furnace will go on basic iron when the company's new steel plant is placed in operation, which will probably not be until after the first of next year.

A Nelson Valve Celebration

The Nelson Valve Company, Wyndmoor, Pa., on September 6 held its annual gathering of sales representatives and executive forces. During the day various conferences were held and the plant, to which many improvements and additions have recently been made, was fully inspected. Following a luncheon at the White Marsh Valley Country Club, a lantern slide lecture, covering the detailed manufacture of the company's product, was given.

In the evening a dinner was given to the officers, department executive heads, sales representatives and a number of invited guests, amid novel surroundings. It was served in the new open hearth steel foundry building, 160 ft. long by 50 ft. wide, which is about completed and which was tastefully decorated for the occasion. As a background to the table, which was in the form of a horseshoe and laid with 50 covers, were the open hearth furnaces, ovens and general foundry equipment, while an electric traveling crane and a bull ladle of the usual foundry type took part in the service. Samuel F. Houston, president of the company, presided at the dinner, assisted by Carlisle Mason, vice-president and general manager. The menu was elaborate. The coffee was served by means of the electric crane and ladle, the coffee being tapped into the cups by means of a small stopper valve in the bottom of the ladle. This crane also served as a means of carriage for an elaborate silver loving cup, which was presented to Vice-President Carlisle Mason as a testimonial from the department executives. M. Sims, superintendent of the foundries, made the presentation speech, to which Mr. Mason responded. Impromptu addresses followed by President Samuel F. Houston, Auditor Stockton Bates, C. E. Huxley, George W. Butters, W. J. Spencer and others.

Among others who attended the dinner were M. D. Baedy, treasurer; Russell Bonnell, secretary; H. I. Landis, assistant secretary; George R. Van Dusen, D. A. Morris, H. J. Moyer, J. V. Schmid, T. K. P. Haines, purchasing agent; J. W. Hyppensteel, assistant purchasing agent; W. J. Spencer, general sales agent; H. C. Baynard, assistant general sales agent, and the following sales representatives: R. E. Thomas, Philadelphia, Pa.; John E. Rollins, Chicago; B. H. Hill, Pittsburgh; Geo. W. Butters, Minneapolis; S. P. Wright, Butte; C. W. Pike and R. D. Pike, San Francisco; G. M. Milligan and C. E. Huxley, Canada; Le Roy Gordon, New York; F. W. Rockstroh, Pittsburgh; James Morton, export department. The department heads included C. C. Peck, superintendent; M. Sims, superintendent of foundries; Fred Fiechter, L. L. Eskell, F. A. Babcock, Richard Ryder, P. J. Collins, J. H. Eddleman, John Fiechter, Thomas Greenwood, W. C. Douglass, C. E. Cookson, Chas. T. Greenwood, Wm. B. Fetterman and John W. Mangan. Among the invited guests were M. Vinstchger, C. H. Simmons, H. E. Harrington, J. H. Vandyck and August A. Miller of *The Iron Age*.

As a souvenir of the occasion each participant was presented with a serviceable leather bill fold, the menu and various other data regarding the plant and its officers being printed on imitation banknotes contained therein. Music was rendered during the dinner by an orchestra screened behind palms, while "The Engineer's Song," by T. K. P. Haines, sung by W. J. Spencer to the tune of "The Old Oaken Bucket," was received with enthusiasm. It is as follows:

Expensively dear are the valves of my boyhood
When various old scrap piles recall them to view,
On boilers, on engines, on much tangled pipe lines,
Their cost, like a river, increasingly grew.
How often with Maggie, in blue gown and bonnet
We carried dad's supper which mother had made;
Dad longed for his cot, he could seldom lie on it
For nightly valve fixing was part of his trade.

PAST CHORUS.

The old fashioned globe valves
The stingy old gate valves,
The rust covered check valves
That leaked in the mill.

But now Nelson valves I acclaim as a treasure
For always at morn when returned to the mill,
I find them the source of unlimited pleasure
Tight, easy to open, obeying my will.
When lightly I touched them, they promptly responded,
The fluid sped quickly, it seemed with delight
To take up its task till the whistle resounded
When gently I closed them—the Nelson's were tight.

PRESENT CHORUS.

The new pattern globe valves
The strongly made gate valves,
The superheat steel valves
Much prized in the mill.

Canada Would Check European Dumping

TORONTO, September 12, 1910.—H. S. Scott, until lately the representative of the Canadian Customs Department in New York, has been sent to London in the capacity of the same Department's chief agent for Great Britain and the Continent of Europe. On account of the increasing volume of exports from the United Kingdom to Canada, and because of the large Continental element in much of the merchandise coming from the United Kingdom to Canada, it has been deemed necessary to have a special agent of the Canadian Customs Department in London. The question often arises whether a given shipment from the United Kingdom is entitled to admission into Canada at the preferential duty rates. The product that is finished in Britain may have received all but the final touches in Germany, Austria, Belgium or some other country not entitled to the benefit of Canada's preferential tariff. The rule made by the Minister of Customs is that 25 per cent. of an article's value must have been added by fabrication in the United Kingdom or other British possessions entitled to the preference to make it eligible for admission at the preferential rate.

It is asserted that there has been some sharp practice on the part of Continental manufacturers and their British agents in order to get their goods the advantage of admission into Canada as British goods. The new agent is expected to check this form of customs fraud and also to facilitate the entry of genuinely British goods at preferential rates. His duties have also in some measure been made for him by recent commercial treaties between Canada and some other nations, notably France, Germany, Italy, Belgium and Holland. These countries are to get the benefit of the treaty rates not only in goods shipped directly from their own ports to Canadian ports, but also on goods they send by way of the United Kingdom. To watch this class of commerce will be part of the new agent's business.

John W. Gates and party recently passed through Toronto. They were received by D. D. Mann, vice-president of the Canadian Northern Railway Company, over whose line they proceeded to Moose Mountain to inspect the iron deposits, and to Key Harbor, on Georgian Bay, where the ore docks are. To a reporter Mr. Gates said that while here he would have a talk over Ashbridge's Marsh as a location for a blast furnace.

C. A. C. J.

Southern Iron & Steel Company Financing.—A Baltimore dispatch says that the Southern Iron & Steel Company has completed financial arrangements which have been pending for some time and has secured $800,000 working capital. Of this amount $600,000 was realized from the sale of one-year 6 per cent. notes and the remainder from the sale of debenture bonds. Other measures are under consideration for strengthening the company's position.

Recent contracts secured by the Penn Bridge Company, Beaver Falls, Pa., include two additions to the Ingram-Richardson plant and an addition to the Standard Gauge Steel Company's plant, Beaver Falls; a 400-ft. bridge to be erected at Solong, Maine, and a heavy girder bridge at Butler, Pa.

British Iron Trade Outlook

While the pig iron market has been unsatisfactory, the finished iron and steel trade in Great Britain has shown some improvement this month. In the first week of September prices of Cleveland pig iron were about 6 pence lower than in the preceding week. Warrants showed 5 pence decline, or from 49 shillings 10 pence to 49 shillings 5 pence. Shipments of Cleveland iron in August were 100,066 tons, against 84,541 tons in July. Connal's stores showed an increase of 12,820 tons from July 31 to August 30, when the holdings were 457,601 tons. The increase in July was 8732 tons and in June 1452 tons. The possibility that some demand for pig iron might develop from Russia received some attention. A number of Russian furnaces shut down because of the spread of cholera and prices there advanced, leading to a request from consumers that the Government reduce the import duty. A conference of producers and consumers was held to consider the matter.

In the British steel trade there is a better feeling, partly because shipbuilding orders have been on a better scale. In August 35 vessels with a gross tonnage of 41,545 were launched on the Clyde, and new orders were booked for about 50,000 tons. Three new battleships are also planned, and Canada may soon make a beginning in providing a navy. Rail business is rather better. Mills are still holding to £5 10s. for standard sections. On gas pipe skelp an advance of 5 shillings has been made by the Gas Strip Association. In plates there is a firmer market, and angles, sheets, hoops and rivets are more active. Steel makers in the west of Scotland have had some inquiry for steel for the new Quebec bridge. The Cleveland Bridge & Engineering Company is the one British firm bidding on this bridge. There are three competitors—one each in Canada, the United States and Germany.

August Copper Production and Stocks

The August statement of the Copper Producers' Association shows a decrease in stocks of copper in the United States in that month of 1,759,433 lb. The statement in full is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	170,640,678
Production of marketable copper in the United States from all domestic and foreign sources during August	127,803,618
Deliveries of marketable copper during August:	
For domestic consumption	67,731,271
For export	61,831,780
	129,563,051
Stocks of marketable copper of all kinds on hand and at all points in the United States September 1	168,881,245

The August, 1910, production and deliveries compare with August, 1909, as follows:

	Production.	Deliveries.	Surplus.
August, 1910	127,803,618	129,563,051	Dec. 1,759,433
August, 1909	120,597,234	107,996,911	Inc. 12,600,324

As compared with July, the production in August increased 9,433,615 lb.; the domestic deliveries increased 11,023,096 lb., and the deliveries for export increased 2,424,613 lb.

James McLean of Phelps, Dodge & Co., Inc., has been elected chairman of the association. R. L. Agassiz of Calumet & Hecla takes Mr. McLean's place on the Executive Committee.

The fortnightly bulletin of the American Railway Association shows that on August 31 there were 50,729 idle freight cars on the railroads of the United States and Canada, compared with 73,679 on August 17 and about 140,000 at the opening of July. The number of idle cars August 31 was less than 2½ per cent. of the total equipment.

The Koppel Car Plant to Be Doubled

F. G. Ross, engineer, Farmers' Bank Building, Pittsburgh, is preparing plans for new buildings that will double the capacity of the Orenstein-Arthur Koppel Company's plant at Koppel, Beaver County, Pa., in the production of steel and wood industrial cars, portable track, &c. M. F. Howley, Berger Building, Pittsburgh, has the contract for leveling and filling in the site for the new extension, furnishing the concrete floors in the buildings and building the concrete piers for the support of the steel frame. The additions consist of an extension to the present erecting shop, 75 x 200 ft., having an electric traveling crane; machine shop, 75 x 80 ft., with full line of machine tools; blacksmith shop, 50 x 75 ft., to contain steam hammers, &c.; heavy car shop, 75 x 125 ft., with electric traveling crane; wood shop, 50 x 100 ft., and a yard crane runway about 25 x 250 ft., with a 10-ton electric traveling crane. The buildings are to be of steel, with corrugated iron siding and composition roofing. Other equipment required includes water tube boilers of 250 hp.; a 150 to 200 kw. generating set having high speed engine, switchboard, &c., a two-stage air compressor, a number of motors from 5 hp. up for driving the machinery and the necessary wiring from the power house to all electrical equipment. Bids for this work will be taken about October 15, and as soon as the weather opens up next spring the erection will be started.

The Use of a Mixer in Electric Refining of Steel

William R. Walker, in charge of the technical investigations of the United States Steel Corporation, was granted a patent recently on a method of employing the electric furnace in connection with the Bessemer converter or the open hearth furnace in the manufacture of steel. The application for the patent was filed April 21, 1906. The following details of the process are taken from the patent papers.

For the initial treatment of the pig metal an acid lined open hearth furnace or a Bessemer converter is employed. The metal is thus desiliconized and in part decarbonized, from 0.04 to 0.30 per cent. carbon being left, to prevent an oxidized condition and permit of more readily maintaining a fluid condition. It is then introduced into a mixer, preferably basic lined. On its way to the mixer it passes through a spout provided with a skimmer and the floating acid slag is removed to prevent damage to the basic lining of the mixer. In this mixer a basic slag aids in dephosphorizing the metal or neutralizing the acid slag which may be mixed with it. From the mixer from time to time charges are withdrawn and introduced into basic lined electric furnaces, wherein the metal is treated with additions of oxide of iron, together with burnt lime or limestone to dephosphorize and desulphurize it. In the electric furnace silicon, manganese, vanadium, nickel or other elements required to modify the character of the resulting steel may be introduced.

The Standard Scale & Supply Company, Pittsburgh, reports that its Eclipse concrete mixer is having an extensive sale among contractors, and that the volume of business booked so far this year on scales is the largest in its history. Its Standard scales are being used to a large extent in the weighing of coal, and many of the larger Western railroads have also commenced to use them. The plant at Beaver Falls, Pa., is being operated to nearly full capacity. Prospects for business in the concrete department are so encouraging that the company contemplates making an addition to its assembling department, but no decision has yet been made as to the details.

The New York Electric Drill

A new line of electric drills is being brought out by the New York Electric Tool Company, 136 Liberty street, New York, which have many interesting features. Announcements of these tools appeared under New Tools and Appliances in *The Iron Age*, September 1 and 8, 1910. The smallest size is 10½ in.

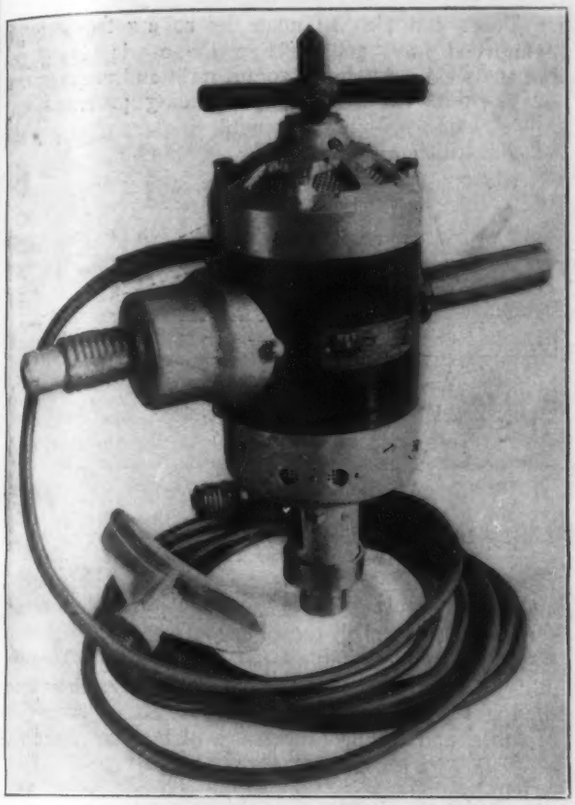


Fig. 1.—The Largest of the New Electric Drills, Made by the New York Electric Tool Company, New York City.

high by 4 in. in diameter, weighs 6½ lb., and can drill ¼-in. holes in steel and ½-in. holes in wood. Its normal speed is 1000 rev. per min. The next larger has a capacity of ½-in. holes in steel and 2-in. holes in wood, and the largest shown in Fig. 1 will drill ¾-in. holes in steel and 3-in. holes in wood, weighs, complete, 22 lb., is 14½ in. high by 5 in. in diameter, and has a normal speed of 200 rev. per min. All the drills contain specially designed motors, whose armatures drive the chuck spindles by hardened steel and phosphor bronze gears. They also are all of the air cooled type, and are equipped with fans which draw air in at the top through grated openings and discharge it through others on the sides.

Referring to Fig. 1 it will be noticed that the switch controlling the electric current is on the cross bar, and by sliding it the current is turned on or off. The ends, one containing the gears and the other the commutator, are made of a special aluminum alloy for lightness, but are strong enough to withstand hard

Fig. 2.—Interior View of Drill Frame, Showing Poles and Winding.

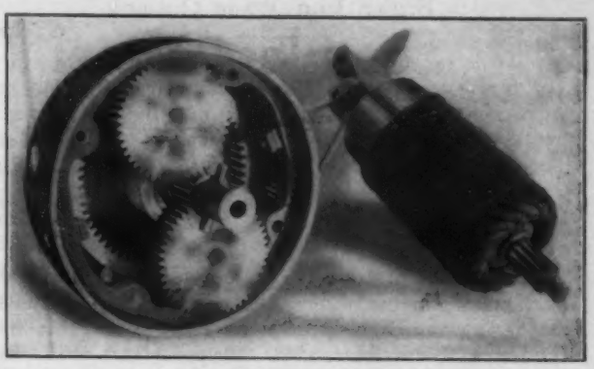


Fig. 3.—The Phosphor Bronze Driving Gears and the Armature and Fan.

usage. The frame or body portion, forming a protection to the armature, is of crucible steel and thoroughly annealed to give the maximum permeability. An interior view of the frame with its four series wound poles and two heavy self-feeding carbon brushes set radially 90 degrees apart is shown in Fig. 2. The front and rear heads and the body are connected together by four long bolts, which can be removed by taking off the nuts on the rear head. On the top of the rear head is the screw for feeding the drill that can be replaced if desired by a breast plate.

The armature, Fig. 3, is built up of soft steel laminations insulated with a coating of special japan and mounted on a hollow steel shaft. The coils are form wound, which makes them easily replaceable and consist of silk insulated copper wire taped with silk and dipped in oil and a moisture proof compound. Around the coils are wound three separate bands of piano wire, which prevent any tendency of the windings to fly apart due to the high speed of the armature. The commutator is made extra large, thus insuring long life, and has three bars per slot in the armature. On one end of the hollow shaft is an aluminum fan, with six blades designed to draw the air through the rear head past the motor, thus keeping it cool. On the other end of the shaft is a hardened steel pinion with cut teeth. This is shown in Fig. 3, the two cross arms acting as a key setting into a slot on the shaft. The pinion is subjected to more wear than any other part of the drill, and consequently even when made of the best material will in time have to be renewed. The renewal can be made by running a rod through the shaft to force the pinion off, when another can be readily put on.

Through the steel pinion the armature drives two hardened and tempered steel gears, that in turn internally drive a large phosphor bronze gear to which is attached the drill socket. A thrust bearing in the front head takes the entire thrust of the working load and distributes it through the frame to the breast plate in the rear head or the cross arms, depending upon which is used for drilling. Thus none of the load is carried on the rotating parts. The armature shaft has independent ball bearings.

An assessment of 15 per cent., or $150, on each $1000 bond of the Passaic Steel Company, Paterson, N. J., was payable September 8. The total of outstanding bonds is about $2,000,000. The committee of bondholders which bought in the property at foreclosure sale and is now operating it made the assessment for the purpose of paying $70,000 to $80,000 in taxes and receivers' and court fees. The operation of the structural plant is carried on in the name of the Passaic Structural Steel Company.

The Sloss-Sheffield Steel & Iron Company is blowing in one of its City furnaces at Birmingham, Ala., making five stacks now active.

Seamless Steel Tube Manufacture

With Special Reference to the National Tube Company's Processes

BY J. F. SPRINGER.

One of the first needs of tubes followed the introduction of gunpowder, but the tubes used were short, and their production seems to have led to no great and fundamental development of the industry. With the introduction of gas for lighting came a strong demand for tubing. So expensive were the tubes which were then mechanically possible that the attempt was seriously made of using old gun barrels. A thread was formed on the outside at the smaller end of such a barrel and one on the inside at the larger end. With the joints thus made a gas pipe could be constructed quite reasonably for the time, owing probably to the great number of useless guns in the world at the close of the Napoleonic wars.

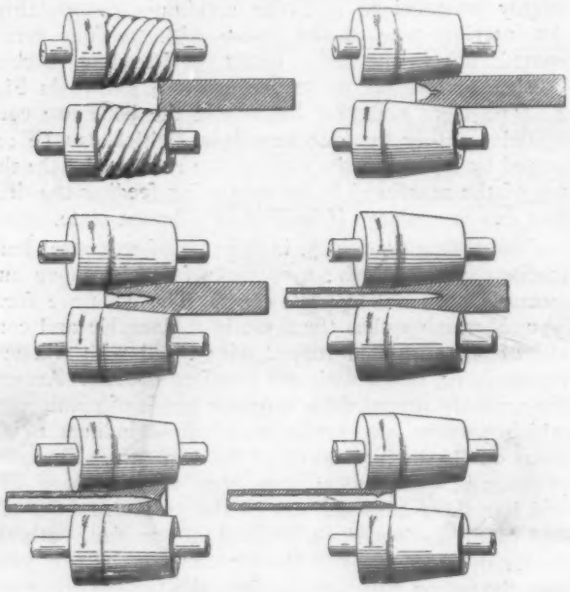


Fig. 1.—Successive Stages in the Rolling of a Tube by the Mannesmann Process.

The demand for tubes thus begun has been greatly augmented by the enormous use of tubing in steam boilers and for the piping, and the tremendous demand for tubing during the hight of the bicycle's popularity and continued to the present time by the development of automobile construction. These latter uses require a tube that is light, strong and approximately perfect, while tubing for boilers and the transmission of steam must be not only sufficiently strong to withstand high pressures, but uniformly perfect everywhere. Such tubes can be made by the boring process, but this is slow, wasteful of metal and expensive to perform.

Tubes can also be made by rolling flat strips to cylindrical form and welding the overlapping edges, but the weld is likely to be uncertain and uneven. One or more of the recent butt welding processes may make thoroughly reliable pipe, but inventors earlier sought to accomplish the object in a speedy and commercial way by a rolling process. There are rolling mills which perform practically all the operations from the ingot or billet to the finished product for large sizes of tubes, and rolling processes which perform the initial operation of piercing the billet, but, so far as the writer is aware, there is no rolling procedure which accomplishes for all sizes the whole of the work. The piercing of the billet is the crucial matter in the production of seamless tubing.

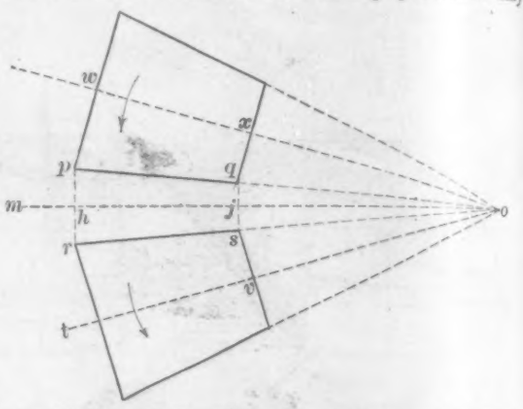


Fig. 2.—Diagram of the Stiefel Roll Arrangement to Prevent Twisting of the Tube Fibers.

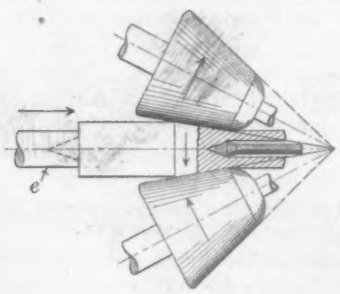


Fig. 3.—Stiefel Arrangement with the Roll Axes in the Same Plane.

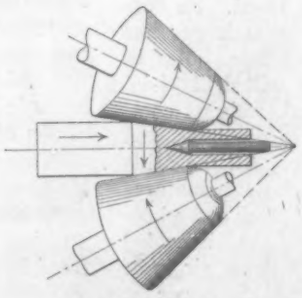


Fig. 4.—Stiefel Arrangement with the Roll Axes Skewed.

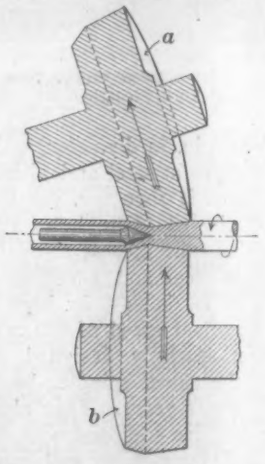


Fig. 5.—Charnock Tube Rolling Arrangement.

The Mannesmann Process

In *The Iron Age* August 29, 1907, an account was given of the Mannesmann process of producing an axial rupture in a cylinder by rolling it under pressure between two rolls, whose neighboring surfaces move in opposite directions. Two difficulties attend the use of parallel cylindrical rolls, the first being that the rupture is not symmetrical; and, however, the forms of the rolls may be modified or their relative disposition changed, it is impossible to obtain a straight, round and perfectly central perforation. This difficulty has been met very effectively, although not perfectly, by using

a forming mandrel. The second difficulty relates to the continuity of the process, for very long cylinders cannot be pierced and formed with parallel cylindrical rolls. To continue the process some means are necessary to start and stop the work alternately, as by interrupting the roll surface longitudinally, or by removing and replacing the work. To subject the surface of the bar to the two mutually perpendicular movements of a rolling and a longitudinal forcing would, apparently, be out of the question. It is practically necessary, too, that the longitudinal pass between the rolls shall be wider at the entrance than further on, so as to permit a more or less gradual reduction of the diameter. And so, even with the Mannesmann devices, the stage of advancement was reached where the rolls were made conical, and with their axes inclined to the plane of the pass. By referring to Fig. 1, a Mannesmann arrangement may be seen. The billet enters the pass from the right. It will be noticed that the axes of the rolls are at an angle with the pass, and that the pass converges. The object of the arrangement of the axes is to produce a drawing effect on the heated billet and thus force it through. The peripheral speed of the rolls varies through the pass, increasing from the entrance where their diameters are smallest. The billet growing smaller in diameter for that reason also rotates faster between the larger diameters of the rolls. The result of this variation in the angular rotation of the various parts of the billet in the pass causes a twisting of the fibers. For a while this was thought to be advantageous, and perhaps for certain qualities of material it may be. Ordinarily, however, the metal which it is desired to use has been worked but little, and so cannot be assumed to have the uniformity and ductility necessary for so severe an ordeal. At any rate even in the Mannesmann development, an effort was made to offset the twisting effect at the entering end by a second opposite twisting in the outgoing portion. This was accomplished by so shaping the rolls that the pass assumed an elongated hour glass form. While this might restore the twisted fibers to their original straightness, it had the defect of acting too violently upon the metal.

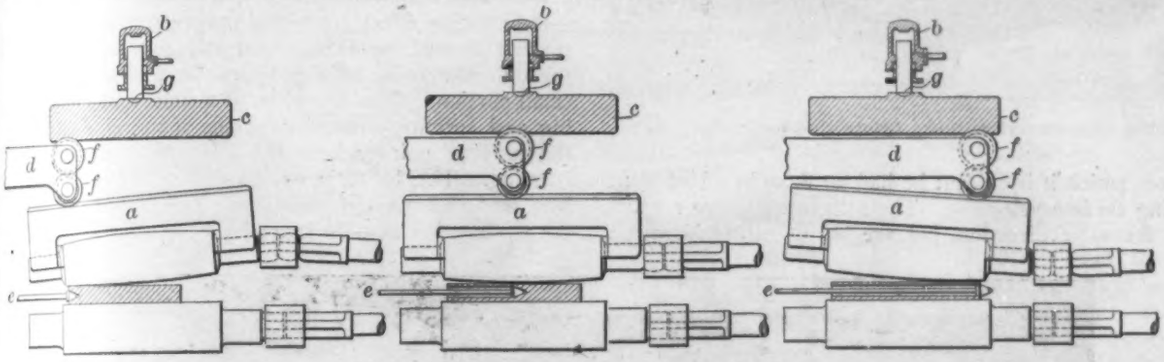


Fig. 6. Fig. 7. Fig. 8.

Successive Stages in the Diescher Billet Piercing Process.

Stiefel's Development

Next a rearrangement of the conical rolls was effected. In Fig. 1 the axes of the two rolls, while not parallel themselves, do lie in parallel planes perpendicular to the plane of the pass. Instead of this arrangement, by converging the axes on the side of the smaller ends of the rolls it was sought to harmonize the action of the various rates of peripheral speed. This is made clear in Fig. 2, where for simplicity the skewed arrangement is omitted. The conical rolls prolonged would have a common vertex at *o*. The pass between the rolls is symmetrical about the axis *o m*. If the two rolls are rotated in the same direction and at the same angular velocity, the peripheral speeds at the points *p*, *r*, *s* and *q* will be proportional to the arms *w p*, *t r*, *v s* and *x q*, respectively. A billet occupying the pass will have these peripheral speeds communicated to its surface, and if they are proportional to the arms *h p* and *j q* the angular velocities will be equal. In other words, if the arms *w p* and *x q* are proportional to the arms *h p* and *j q*, and they are, as can be easily proved by geometry.

The same is true of all points lying between *p* and *q* and likewise between *r* and *s*. Therefore by arranging conical rolls with the vertices of the complete cones coinciding, the various peripheral speeds throughout the pass are reconciled so that the billet will have the same angular velocity at all points and there will be no twisting of the steel. This advance in the art was due to R. C. Stiefel, Ellwood, Pa. Figs. 3 and 4 show the principle of the common vertex in two applications. In Fig. 3 the rolls have their axes in the plane of the pass. The forward movement of the billet through the pass is obtained by the hydraulic ram *e* operating upon its rear, which did not prove very satisfactory. In Fig. 4 the axes of the rolls are inclined to the plane of the pass and lie on opposite sides of it, but the vertices of the complete cones lie in the same plane perpendicular to the billet axis. In both procedures the smoothing and forming mandrel has its head where the most pronounced grip to the pass is secured. The entrance to the pass is at the larger ends of the rolls, precisely the opposite of the Mannesmann arrangement. By skewing the rolls properly the forward movement of the billet is obtained and the process of rupturing the center made continuous.

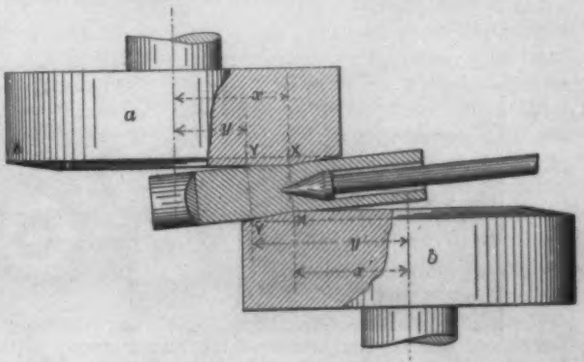


Fig. 9.—The Stiefel Billet Piercing Disk Arrangement.

The Mannesmann form of rolling rough tubes has since been superseded by such modifications as the one just described, but the fundamental idea of rupturing the center by operating on a billet with two rolls rotating in the same direction is still adhered to. It is the germ from which practically the whole industry of manufacturing seamless tubes from solid billets has grown.

Charnock's Arrangement

About the time Stiefel was working to eliminate the torsional effect by unifying the peripheral speeds, Charnock invented the arrangement shown in Fig. 5,

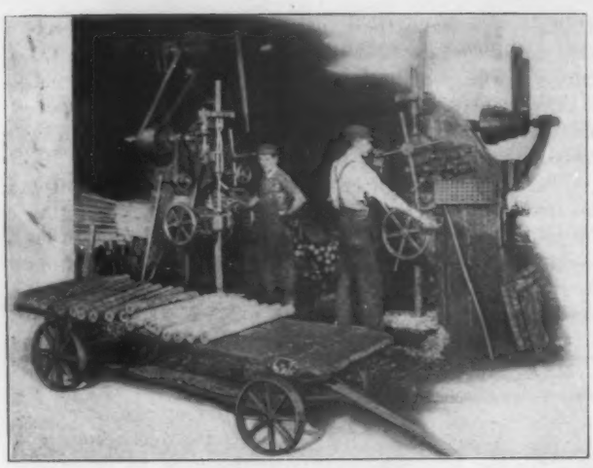


Fig. 10.—Centering Billets Before Heating for Piercing.

from which it is evident he had no thought of harmonizing surface velocities. The rolls *a* and *b* are rotated in the same direction, but are by no means identical, the two conical surfaces on roll *a* both tapering in one direction, while those on roll *b* taper in opposite directions. These two rolls are so disposed that, apart from the skewed relation to the plane of the pass, the axis of one is parallel to the axis of the pass. The axis of the upper roll, however, is inclined to the axis of the pass. The pass converges and then expands. The position of the mandrel head is in the final expanding portion.

Diescher's Cross Rolling Process

At about the close of the last century a Pittsburgh inventor, Samuel Diescher, developed a modification of the Mannesmann process of rupturing the center of the billet by cross rolling. Figs. 6, 7 and 8 are views representing the beginning, the middle and the close of the operation of piercing a billet. The lower cylindrical roll is vertically adjustable, but remains fixed during operation. The upper roll remains in its vertical plane, but may be tilted, or rocked, during the progress of the work. This roll is rotatably mounted in a yoke, *a*. At *b* is a hydraulic cylinder, which operates against a pressure plate, *c*. Between this pressure plate *c* and the yoke *a* is a reciprocating arm, *d*, carrying rollers *f*, *f*, which advances in unison with the piercing mandrel *e* and transmits the pressure of the plunger *g* from the plate *c* to the yoke *a*. Ultimately this pressure is communicated to the billet at a point just above the head of the mandrel. Three actions may simultaneously be performed upon a billet —the rotative effect producing progressively the initial rupture along the axis, a varying pressure exerted through the rolls by the hydraulic plunger upon a small portion only of the billet at a time, and the piercing and forming operation of the mandrel following the moving point where the rupture is continually forming. The billet is not passed through the mill. The material pressed out in the process of forming the perforation goes to extend the length of the tube beyond that of the original billet. No twisting motion is imparted to the billet, as the axes of the rolls are parallel and in the same plane with that of the pass.

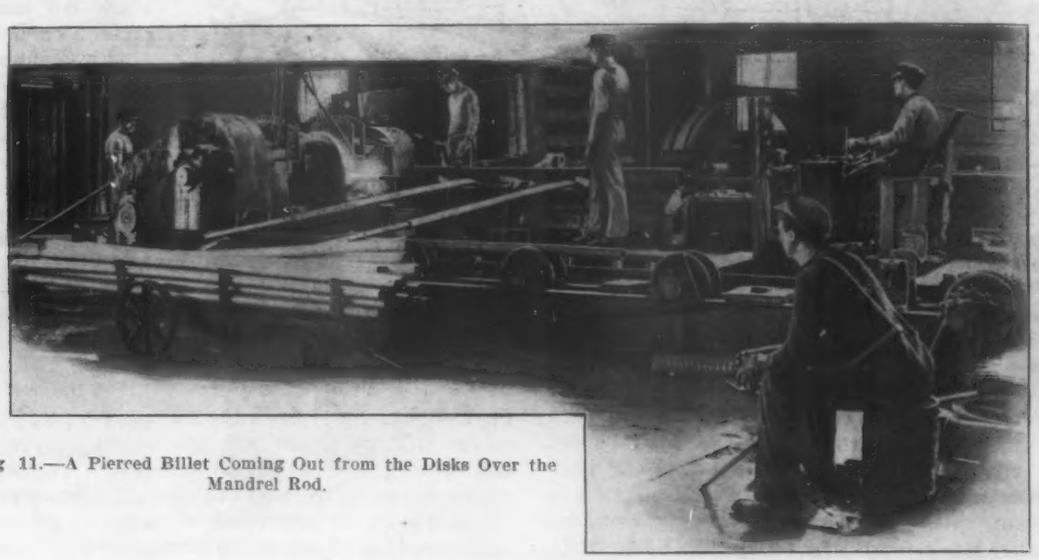


Fig 11.—A Pierced Billet Coming Out from the Disks Over the Mandrel Rod.

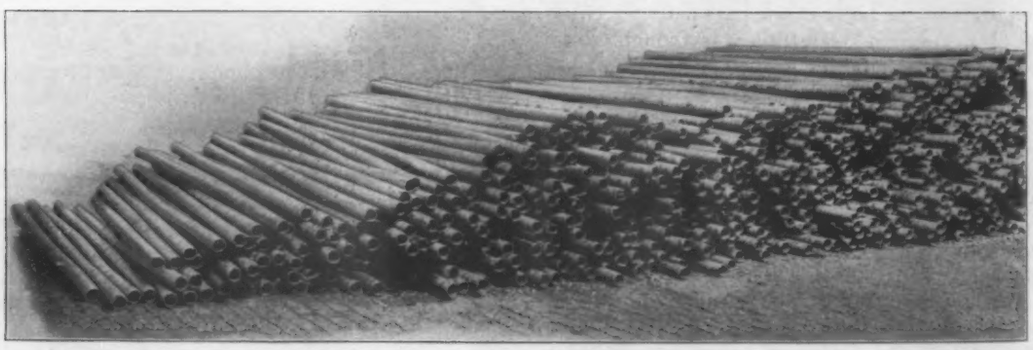


Fig. 12.—A Pile of Pierced Billets.

The Stiefel Billet Piercer

The process now used by the National Tube Company employs the Stiefel billet piercing system, but instead of rolls disks are substituted, arranged so as to overlap each other, as may be seen in Fig. 9. They are substantially alike and rotate in the same direction at the same angular velocity. Between the overlapping portions is a pass wherein a billet may be rotated. The faces of the disks are centrally planar and somewhat beveled toward the periphery. The plane portion of each disk is opposed, in the pass, to the beveled portion of the other. Consequently the

pass is in section of hour-glass form. As the two disks are moving at the same rate at this locality, precisely the same angular velocity is impressed upon the billet at this point. At the entrance of the pass the surface velocity impressed by the disk *b* is greater than that imparted by the disk *a*, because of the corresponding long and short arms of rotation. This will produce a want of harmony, one side of the billet at this point being rotated at greater angular velocity than the other. Nor is the angular impulse communicated at Y Y the same as that communicated at X X. For the lower disk, the arms of rotation x' and y' are proportional to the corresponding radii of the billet, and the angular impulse of the two ends of the pass is the same, but for the other disk the long arm x corresponds to a short radius of the billet and a short arm, y, to a long radius. However, as the sum of y and y' is the same as the sum of x and x', the average surface velocity imparted at Y Y will be the same as that imparted at X X. Upon the lower side of the pass, at Y Y, the metal is hurried faster peripherally than at X X. But at the upper side this is compensated for by a corresponding retardation. So the surface speeds at the two ends of the pass, and, indeed, throughout it, on the average are the same. Equal surface speeds along elements of a conical surface will not produce equal angular velocities, but experience seems to imply that any inequality of this kind is not very great.

By skewing the axes of the disks a forwarding movement is imparted. The rotation between disks is effective in producing the axial rupture, and the mandrel head, shown in position in Fig. 9, forms the rupture into a substantial and fairly well rounded hole.

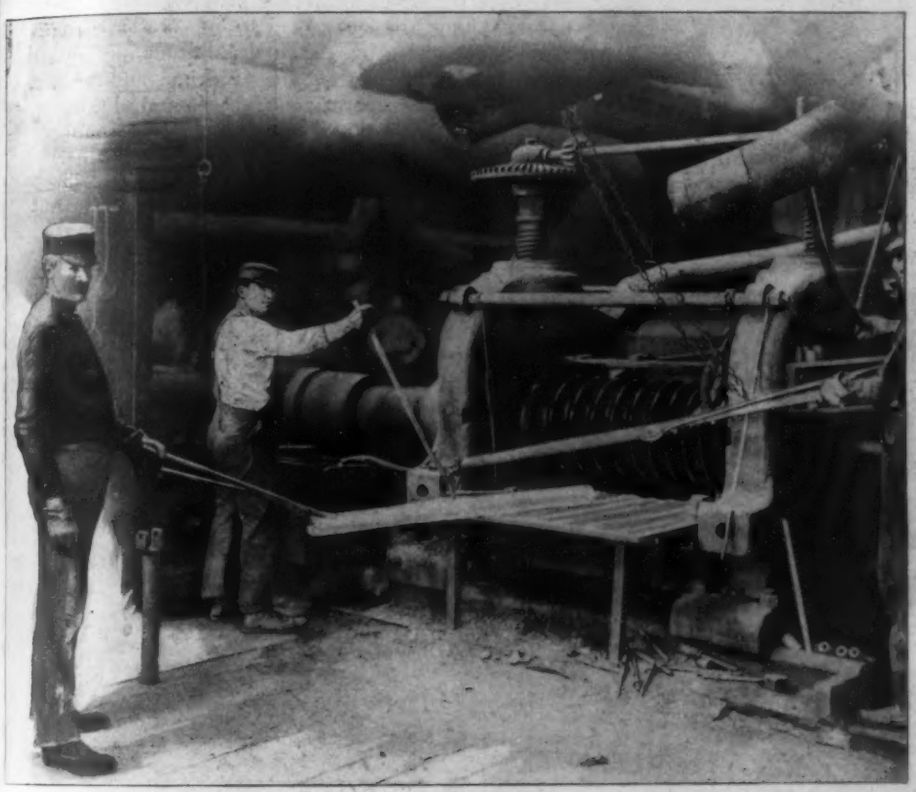


Fig. 13.—Rolling Tubes Hot After the Piercing Operation.

The National Tube Company's Other Processes

As typical of the manufacture of seamless steel tubes may be taken the processes employed by the National Tube Company in making Shelby tubing. To begin with, the steel must be of a character suited to the rather severe requirements of the process. This process includes not only the deformations and reformations due to compression while being rolled, and the movement back and forth of the fibers occasioned by the nonharmonization of rotational speeds, but also to the subsequent operations of cold drawing. The carbon content may be quite low, at 0.17 per cent., or it may range higher, between 0.35 and 0.50 per cent. There may be a nickel content of 3.50 per cent. Whatever the precise analysis of the steel, it is received by the tube mill in billets or bars about 10 ft. long and ranging in diameter from 2½ to 6 in. These bars have previously been rolled down from square blooms, 7 x 7 in., about 6 ft. long, weighing about 750 lb. Before being passed through the rolling mill any apparent superficial irregularities are chipped off with pneumatic hammers. Then, after being annealed, they are rolled to the round bar form, cut into convenient lengths and sent to the tube mills. The pieces may be as short as 5 ft. or as long as 10 ft., according to the tube to be produced, and are now termed billets.

The piercing is done when the metal is nearly white hot and the perforation must be exactly central, as subsequent operations cannot be depended upon to correct any eccentricity. The billet is centered by drilling and while cold, as shown in Fig. 10. Billets thus centered are fed into a heating furnace having an inclined bottom, and roll down toward the exit where the temperature is high. Having acquired the proper heat, they are fed into the piercing machine, the centered end being presented to the disks, which grasped the billet rotates it and draws it on to encounter the malleable iron head of the mandrel. In Fig. 11 the billet is shown coming from the disks. There is no great noise. The billet moves on turning all the time and growing in length as the metal is forced from the center and gives rise to a corresponding longitudinal expansion. The mandrel remains absolutely fixed. The billet pierced and lengthened becomes a tube. Fig. 12 shows a pile of these tubes in the first stage of their completion. Seamless brass or copper tubes can be made from billets cast hollow, but with steel this has not been found commercially practicable. It is possible, however, that such billets of steel may yet be produced by some process of centrifugal casting.

Fig. 14.—Pointed Tubes Ready for the First Cold-Drawing Operation.

After the pierced billet is cut in two by a hot saw, the next operations are performed by a rolling mill of the usual design, such as is shown in Fig. 13. The billet is heated to the proper temperature, and a round bar of tool steel inserted into its perforation. It is then passed a number of times between rolls with semicircular grooves of varying size. By this means the pierced billet grows into a rather long tube with thinner wall, but it is not yet perfectly round nor accurately uniform in thickness. These qualities appear to be commercially impossible by any hot process, so cold drawing is resorted to after the tube is first pointed hot by a machine hammer and put through an acid bath to remove the scale and render it ready for drawing. In Fig. 14 are seen a quantity of the pointed rough tubes.

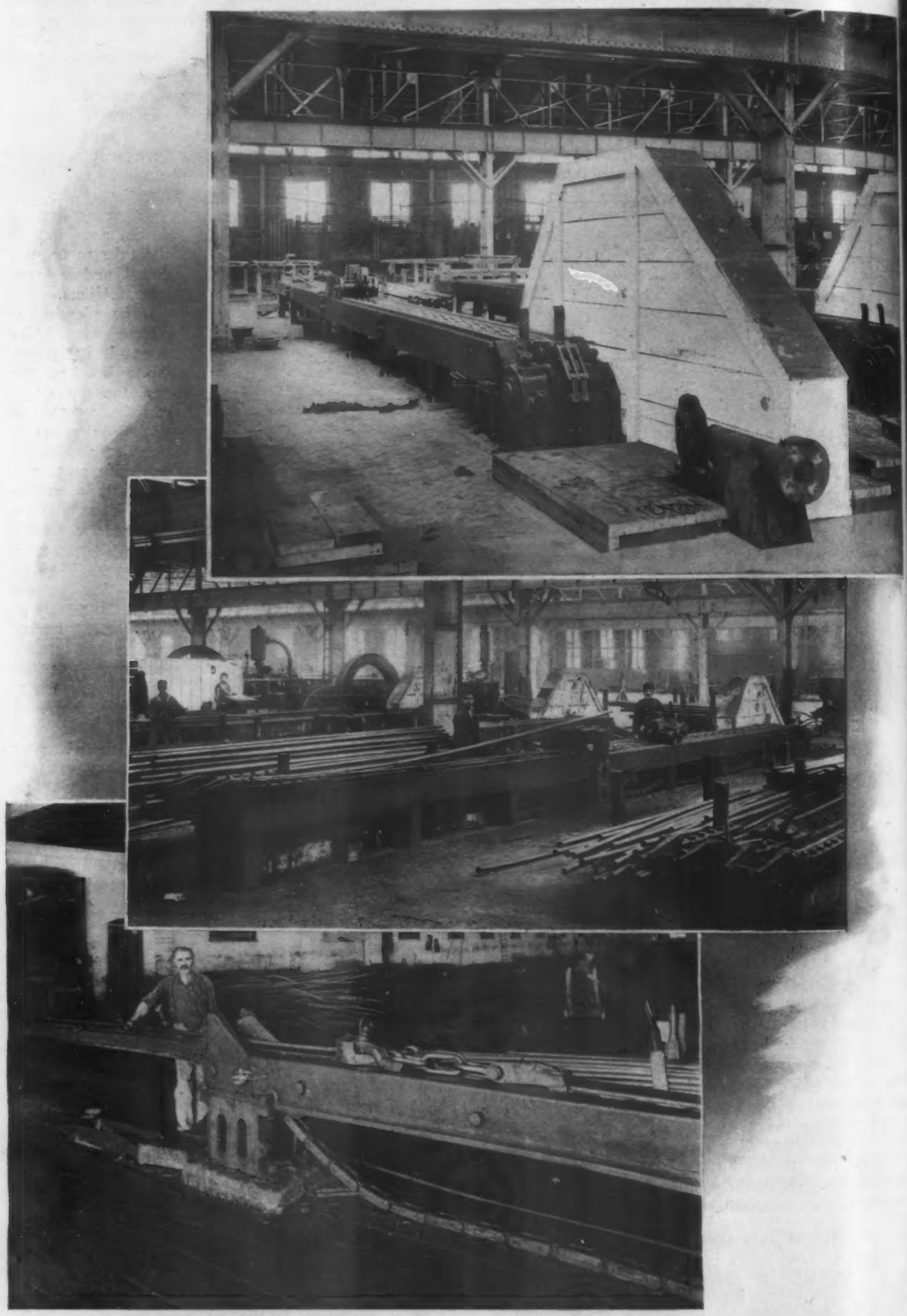


Fig. 15.—Three Views of the Cold-Drawing Benches in the Standard Plant of the National Tube Company at Ellwood City, Pa.

The draw bench is not peculiar to the steel industry as precisely similar machines are used in manufacturing brass and copper tubing. It consists essentially of a long frame within which an endless strip of chain is operated, passing over a wheel at each end of the bench. In Fig. 15 are seen three views of the cold drawing machines. In the upper view may be seen the great chain as it comes over the sprocket at one end of the bench. At the right hand of the middle view the slack returning chain is disclosed beneath the bench. In the bottom view is seen the griping mechanism. A general view of a portion of the cold drawing bench room is given in Fig. 16. With its pointed end secured in the grip of the tongs, the tube is powerfully drawn along to force the cold steel through a reducing die. If the interior diameter is ½ in. or more, a mandrel is used inside the tube. This is held in place, even with the die, by a long rod extending through the tube. This operation of cold drawing may have to be performed but twice, or it may have to be performed a score of times. On account of the hardness and brittleness which are consequences of cold drawing, the tube must be annealed between drawings. As this annealing process gives rise to scale, there must be a repetition of the pickling process also. It will be seen, then, that any considerable reduction of steel tubes by cold drawing is attended by a multiplicity of operations. Happily, certain of these may be accomplished wholesale. And so the cost is kept down.

Fig. 16.—A General View in the National Tube Company's Cold-Draw Bench Room.

Unless the requirements are such that the greatest rigidity must be preserved there is a final annealing. This is performed to suit the requirements of the consumer. In Figs. 17 and 18 are examples of the deformation specially annealed tubes will stand without rupture. These tubes were of low carbon steel, about 20-gauge and of about 1 in. in diameter. At the last operation the point is removed, and the whole tube cut to such lengths as desired.

The uses to which seamless steel tubing are being put are very numerous—about 700 having been tabulated. Some of these relate, however, to large tubing produced by a different process.

Two of the most extensive uses are for the frames of bicycles and certain parts of automobiles, which consume great quantities of seamless steel tubing. The application of this type of tube to steam uses has been productive of an immense demand. The steel used for steam boilers is of a low percentage of carbon (about 0.17 per cent.) and the tubes are annealed very soft. It is hard to tell just where the application of steel tubing will leave off. There are so many uses for long and short pieces of steel with a hole through it that it will not be surprising if the number of them increases for a long time to come and if the extension in recognized fields goes on steadily.

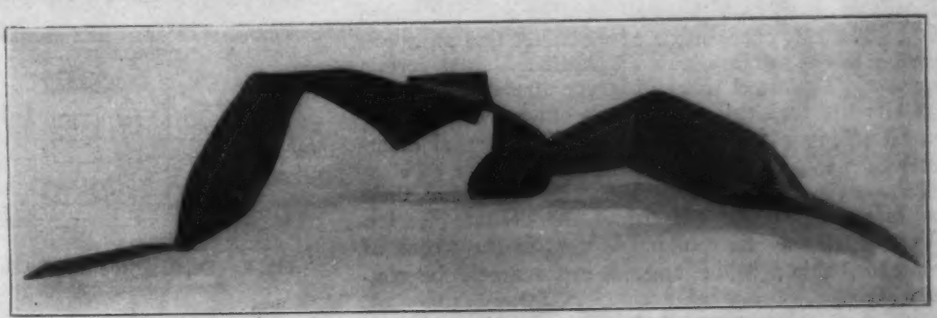


Fig. 17.—An Annealed Seamless Steel Tube Flattened, Twisted and Bent Without Rupture.

Ellwood Ivins Tiny Tubes

There are three limitations, however, which have operated to keep the product of nearly all the manufacturers out of certain fields. It is sometimes desirable to have tubes that are true to size within a very small limit of accuracy, but for most uses this is not essential; there are many uses which demand a tube of

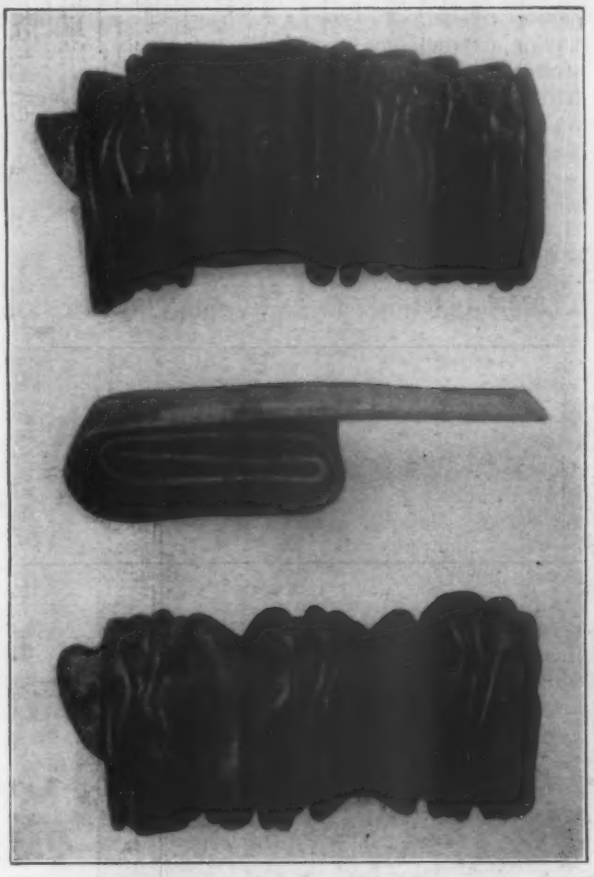


Fig. 18.—Other Examples of Annealed Tubes Deformed Without Sign of Surface Failure.

very small outside diameter and bore, and there are a very great many uses to which tubing of high carbon steel might be put if obtainable at reasonable prices. All these special requirements are met in the product of the Ellwood Ivins mill, Philadelphia. There are manufactured, so far as the writer has learned, the only tool steel tubes commercially produced in the world. Further, tubing may be obtained, both of high and low carbon, that is very close to gauge. And very minute tubes are produced. Thus there is manufactured, not for experimental purposes, but for sale, little tubes no larger than 1-64 in. in outside diameter. Mr. Ivins has produced a tube whose outside diameter was 0.005 in. The bore was probably never measured; it was so small as to be undiscernible with the naked eye. The tiny tubes made of tool steel find an application in the manufacture of physicians' hypodermic needles. Tool steel tubes of larger diameter find uses as bits for rock drills. There is quite a demand for small tubing of mild steel having an external diameter of 3-16 in. for shafts in the manufacture of electric meters. Such shafts are quite light for their stiffness and so are adapted to the delicate service. Very small tool steel tubing is used in the works of watches, although the amount can scarcely be considerable.

The Allentown Iron Mfg. Company, Allentown, Pa., which began the manufacture of cold blast charcoal pig iron in September, 1909, is now building a second furnace, which will be 8 x 30 ft., and will also produce charcoal iron. The new furnace will have a capacity of 2000 tons a year, while the present furnace makes 1000 tons a year. J. K. Bowen is president and H. B. Weaver is treasurer and manager. The selling agents are Rogers, Brown & Co.

The Central Iron & Coal Company's blast furnace at Holt, Ala., which was blown out June 17 for repairs, will probably be put in operation again by October 1.

A Belgian Ratchet Tapping Wrench

In the shops of H. Bollinckx, Brussels, Belgium, holes that cannot be tapped on a Pearn machine are tapped by hand in the manner indicated in Fig. 1. The wrench used is one of ratchet type, which makes it unnecessary for the workman to lift the wrench from

Fig. 1.—A Ratchet Tapping Wrench as Used in the Shops of H. Bollinckx, Brussels, Belgium.

the shank of the tap. The advantages which result are greater rapidity of working and avoidance of giving to the tap a back and forth movement which deteriorates it, and is what the workman is inclined to do with the ordinary wrench. The ratchet is reversible, which permits withdrawing the tap with the same rapidity.

Fig. 2 gives a detail of the wrench showing its construction and principle of action. The wrench hold revolves in the handle, and is provided with teeth which are prevented from rotating in one direction or

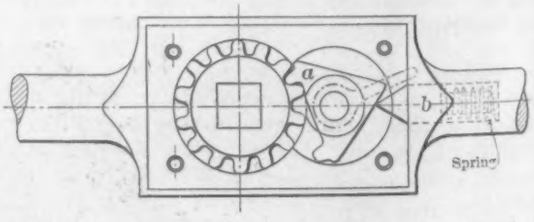


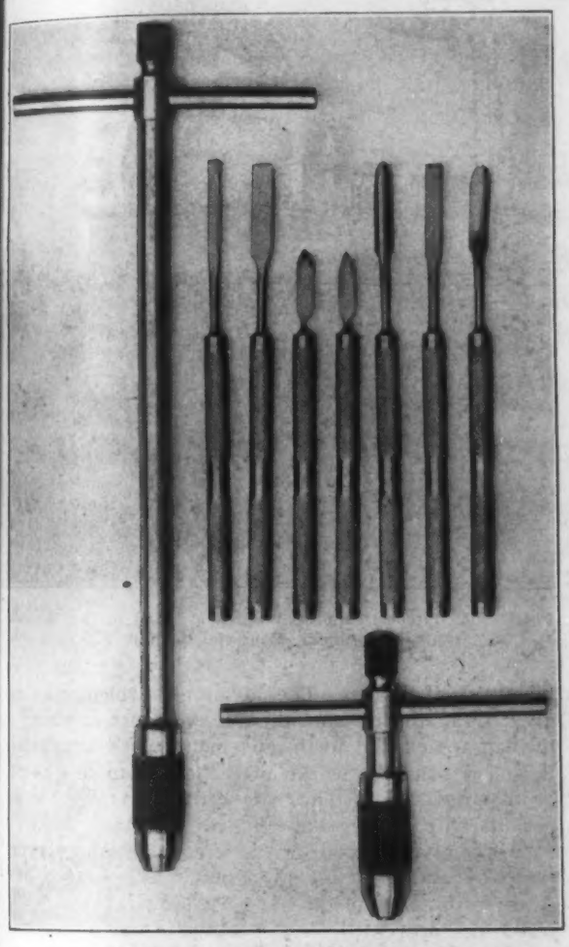
Fig. 2.—Detail of the Ratchet Mechanism of the Wrench.

the other with reference to the wrench handle by the reversible pawl *a*, which is reversed by throwing a lever, shown in dotted lines in Fig. 2, so that the pointed rear end of the pawl piece comes on the other side of the spring actuated plunger *b*. This plunger tends to keep one or the other of the teeth of the pawl in the ratchet according to the way in which it is set, but permits the pawl to retract from the ratchet teeth on the idle stroke of the wrench handle.

The Tariff Board will begin in Washington September 21 a scientific investigation of schedule K of the tariff, the woolen schedule. It is stated that the cotton schedule and the metal schedule will follow.

New Poorman Machinists' Tools

Two new products in the way of small tools manufactured by the J. E. Poorman Company, Inc., 1825 Bristol street, Philadelphia, Pa., are illustrated herewith. The high speed tap wrench fills a need in that class of tools, as with the knurled head a tap can be backed out of the work with the thumb and finger, it is claimed, in one-quarter the time required with the old style wrench. Also, by resting the head or thumb piece in the palm of the hand in starting a tap, a better hold on the wrench is secured, resulting in materially better work and fewer broken taps. The



Long and Short High-Speed Tap Wrenches and Toolmakers' Scrapers, Made by the J. E. Poorman Company, Inc., Philadelphia, Pa.

jaws of the wrench are broached square on the inside, thus giving them a firm grip on any tap within the range of its capacity. The wrenches are made of the best material, well finished and furnished in three sizes, Nos. 4, 5 and 6, taking in taps ranging from 1-16 to 3-16 in., ⅛ to ¼ in. and 3-16 to 7-16 in., respectively. To reach work located at deep and difficult points conveniently, these wrenches are made in three different lengths of shank, varying from 2¾ to 12¾ in. in the No. 4; 3½ to 13 in. in the No. 5, and 4⅝ to 13¼ in. in the No. 6 size.

As was announced under New Tools and Appliances in *The Iron Age*, June 30, 1910, the Poorman Company has also placed before the trade a set of seven toolmakers' scrapers, which are for use in place of the customary makeshifts used in many instances. The handles of the scrapers are of steel tubing, and the cutting points are of the finest grade of tool steel, properly tempered, ground and polished. These are particularly designed for lathe workers for scraping centers, metal patternmakers, electricians, coppersmiths, tinsmiths, automobile mechanics, as well as any of those engaged in any branch of the tool or machinery trade. The seven scrapers include No. 1, having a triangular hollow ground blade; No. 1-A, triangular extra slim hollow ground blade; No. 2, half-round curved blade for use in small bearings, &c.; No. 2-A, with a half-round straight blade; Nos. 3, 3-A and 3-B have flat blades, 5-16, ¼ and 3-16 in. wide. The various tools manufactured by this company are distributed in England through Buck & Hickman, Ltd., Whitechapel Road, London, England.

The Philadelphia Foundrymen's Association

The regular meeting of the Philadelphia Foundrymen's Association, the first after the usual summer recess, was held at the Manufacturers' Club on the evening of September 7. Vice-President Elmer E. Brown occupied the chair. Reports of the various officers and committees were presented.

The committee having charge of the arrangements for the dinner to be held at the October meeting, celebrating the two hundredth meeting of the association, reported progress. From plans under way, this promises to surpass all previous dinners given by the association. The New England, Pittsburgh, Pa., and Newark, N. J., foundrymen's associations have been invited to attend as special guests.

August A. Miller of *The Iron Age*, delegate of the association to the third annual convention of the Atlantic Deeper Waterways Association at Providence, R. I., August 31 and September 1 to 3, made a report in which an outline of the work accomplished by the association both during the year and at the convention was given.

Paul Kreuzpointner, chairman of the Committee on Industrial Education of the American Foundrymen's Association, was the principal speaker of the evening, his subject being "The Establishment of Industrial and Trade Night Schools for the Youth of the State." He urged the members of the association to ask their representatives in the State Legislature to have manual training inserted in the new School Code to be presented at the next session, as part of the elementary education of the common schools of Pennsylvania as a necessary preparation for industrial and trade education. A vote of thanks was extended Mr. Kreuzpointner, after which the meeting adjourned and luncheon was served in the dining room of the club.

The Harris-Smith Coal & Coke Company's Operations

The Harris-Smith Coal & Coke Company, with offices in the Machesney Building, Pittsburgh, and the First National Bank Building, Uniontown, Pa., has recently purchased 143 acres of coal land, underlaid with 5-ft. and 9-ft. veins of coal, in the well-known Connellsville district, in Fayette County, Pa., near several plants of the H. C. Frick Coke Company, with Pennsylvania Railroad connections. Within the near future the company contemplates opening a mine and erecting a steel tipple, houses for workmen, &c., and an initial plant of 100 coke ovens. The machinery in the mine and on the surface will be operated by electrical equipment.

This company has for some time operated a coal mine in another part of Fayette County, on the Pittsburgh & Lake Erie Railroad, in the Pittsburgh district, which produces Youghiogheny gas coal. The production of this mine has recently been increased from 5000 to 8000 tons per month. In Westmoreland County, Pa., along the Pennsylvania Railroad, the company also has 120 coke ovens.

The Humphrey Internal Combustion Pump

An Interesting Exhibit at the Brussels Exposition

One of the technical excursions enjoyed by those who attended the joint meeting of the Institution of Mechanical Engineers and the American Society of Mechanical Engineers in England last July was that to the Pump & Power Company's testing station, at Dudley Port, Tipton, near Birmingham. The report of the meeting which appeared in *The Iron Age*, August 18, gives a brief account of the Humphrey internal combustion pumps, which were there seen in action. A pump similar to these is installed in the machinery section of the Brussels Exposition and attracts a great deal of interest, being probably the most novel exhibit. All of the pumps invented by H. A. Humphrey are remarkable for their elimination of so many parts usually to be found in an internal combustion prime mover. There is no piston, or, at least, no solid one; no piston rods, connecting rods, crank shaft nor flywheel of the revolving type. The functions of piston and flywheel are performed by a moving column of water, the oscillation of which controls the timing of events in the cylinder or explosion chamber. Strictly speaking, the only mechanism about the pump is that which controls the ignition and so interlocks the inlet and exhaust gas valves as to prevent their opening or closing at any but the proper times. These valves and the water suction valves complete the moving parts. The water further accomplishes in the most desirable way—that is, internally—the cooling of the metal parts of the pump and, washing the walls, carries away any deposit that might be a source of pre-ignition. Lubrication troubles are eliminated; no oil is required except a very slight amount for the ignition and interlocking gearing.

Figs. 1 and 2 are views of the exhibit at Brussels and Fig. 3 an elevation and plan of a precisely similar plant, with the addition of a gas producer, for the pump is normally intended to be operated with producer gas. It happens that at Brussels illuminating gas is used, but an inactive producer of a size corresponding to the pump capacity is shown, and the small amount of space it occupies with respect to that of the pump is a striking contrast, as is well brought out in Fig. 3. Fig. 4 is a diagram of one of the earlier Humphrey pumps which has been tested by Prof. William C. Unwin, and Fig. 5 a detail of the latest type of valve gear.

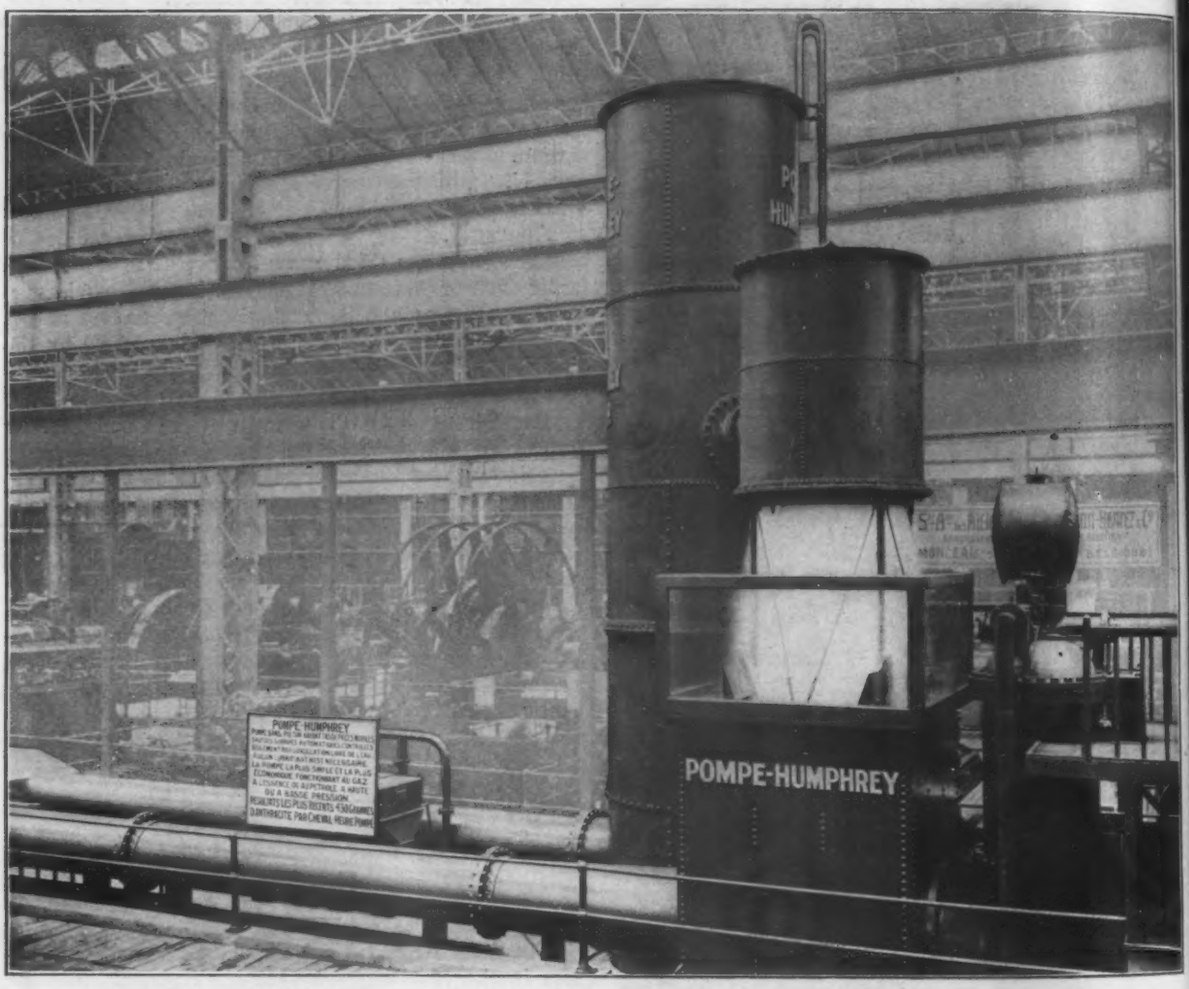


Fig. 1.—The Humphrey Internal Combustion Pump.—Exhibited by the Pump & Power Company, Ltd., London, England, at the Brussels Exposition.

Fig. 4 will serve best to make clear an understanding of the principle of the action of the Humphrey pump. The thermo dynamic cycle on which the pump works has a greater efficiency even than the Otto cycle, for the reason that it provides that which is theoretically required, four unequal strokes. The longest stroke is that which occurs during combustion and expansion while the liquid is forced through the delivery pipe to the elevated tank. On the return oscillation the gases are exhausted. With the next reversal

Fig. 2.—Another View of the Humphrey Pump at the Brussels Exposition.

a still shorter stroke occurs, during which a fresh combustible mixture is drawn in, and on the fourth and shortest stroke this mixture is compressed ready for firing and the repetition of the cycle. There is no valve in the discharge line, so that the water has a free passage from the explosion chamber to the high level tank.

The action of the pump more in detail is as follows: Assuming that it is to be started for the very first time, it is necessary to get the water in motion before the pump will take up its regular cycle of operations. For this reason compressed air is introduced in the combustion chamber, forcing the water to a certain hight in the elevated tank; then the exhaust valve is suddenly opened by hand and the surging of the water established produces the necessary suction to admit a charge through the gas inlet and compress it ready for firing. Following an explosion, the gas expands, forcing the liquid out and toward the elevated tank. When the gas has expanded to atmospheric pressure the moving column of water has attained a velocity which causes it to continue to move until the static head in the discharge pipe brings it to rest. As soon as the pressure is below that of the atmosphere the exhaust gas valve and the suction water valves open, admitting water from the low-level tank, part of which follows the column in the discharge pipe, and the remainder fills the combustion chamber part way or nearly to the level in the low-level tank. This has partly exhausted the burnt gases, and when the column of liquid returns the water suction valves are closed by their springs and the exhausting of the combustion chamber continues until the liquid rises to the level of and closes the exhaust valve. There is still pocketed a small amount of burnt gas in the cushion space under the inlet valve. A further movement of the column of liquid compresses this, causing the second outward movement of the liquid, and when this has created a suction in the explosion space the first charge of gas is drawn through the inlet valve, is compressed by the next return of the surging column and is fired at the point of maximum compression. When the pump is stopped a charge of gas is always left in the explosion chamber and subsequent starting is effected simply by closing the ignition circuit.

While it is not necessary to the operation of the pump to insure that the pocketed gas should be removed entirely on the exhaust stroke, it has been thought best to add a scavenging valve, not shown in Fig. 4, which opens at the instant that the exhaust valve opens and allows air to be drawn in above the exhaust gases, so that when the exhaust is completed only practically pure air is pocketed in the explosion chamber. Ordinarily with a scavenging valve in use a nonreturn valve is provided in the exhaust, so that no burnt gases will be drawn back through the exhaust valve when the latter is open, but only fresh air be drawn in through the scavenging valve. Even without the use of the scavenging valve the pump explodes with absolute regularity and certainty.

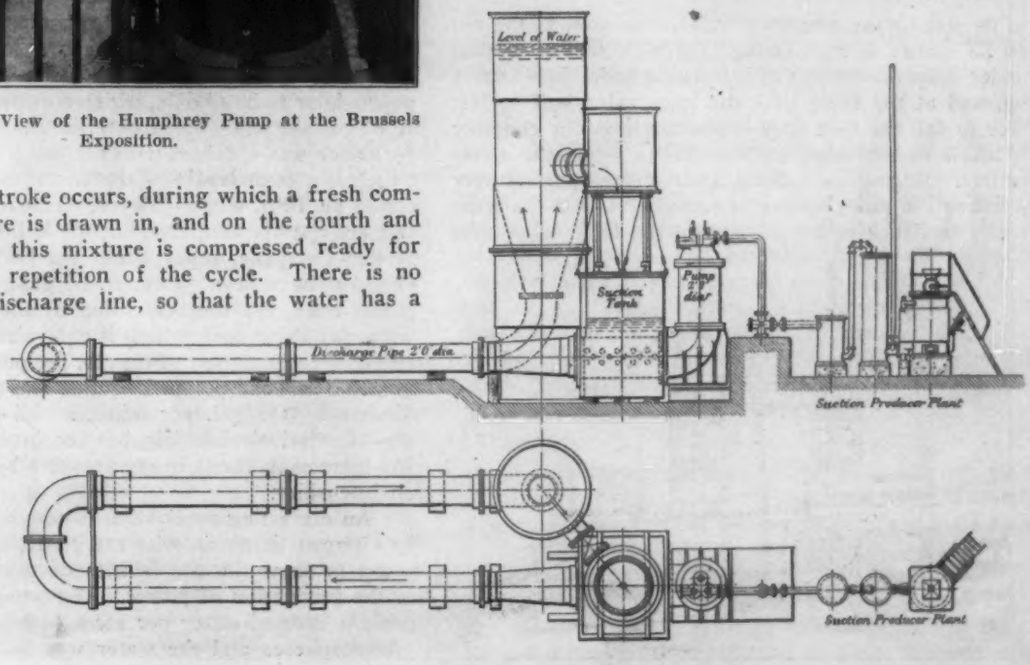


Fig. 3.—Elevation and Plan of a Humphrey Pumping Plant Complete with Gas Producer.

As the opening and closing of the gas valves depends entirely upon difference of pressure on their two sides, it will be seen that some special means is necessary, so that both will not open and close at the same time. Each must open and close before the other is opened and not open again until the other has opened and closed. One form of valve gear by which this is accomplished is shown in Fig. 5, which, however, shows the admission and exhaust valves only and not the scavenging valve. It will be noticed that the admission valve is near the top of the chamber, while

the exhaust valve is considerably lower. In the position shown it may be taken that the exhaust valve has just opened by its own weight and that the products of combustion are being driven out. In the meantime the inlet valve must be held closed. This is effected by a steel plate or bolt, which is free to slide sideways. One end of it projects beneath a nut on the inlet valve spindle and prevents that valve from opening. The plate, under the influence of the one of the two springs which is in tension, tends to return to the right, but cannot do so until the exhaust valve has been returned

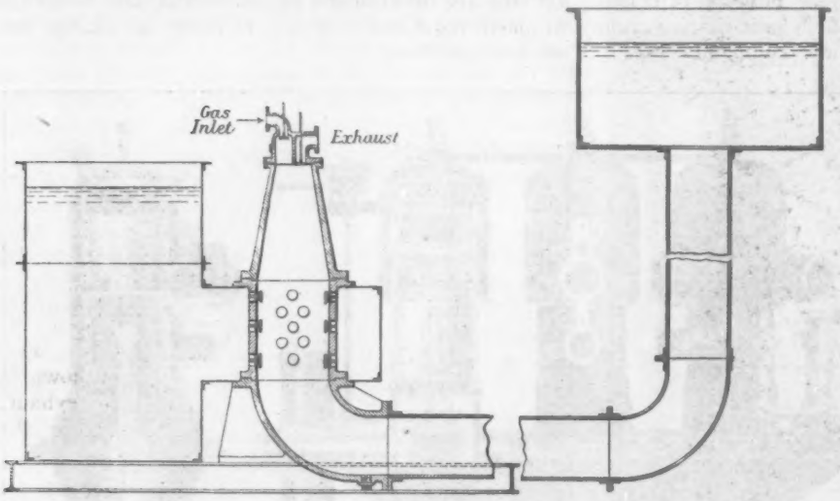


Fig. 4.—Diagrammatic Elevation of One of the First Humphrey Pumps.

to its seat by the returning water. As soon as the nut on its spindle is high enough the plate will be pushed under it by the tension of the spring to hold this valve up, and at the same time the inlet valve will be left free to fall the next time the pressure in the chamber is below that of atmosphere—that is, when the water retires. During its fall the lever will be pushed over to place the other spring in tension, so that the plate will shoot back under the nut on the inlet valve stem

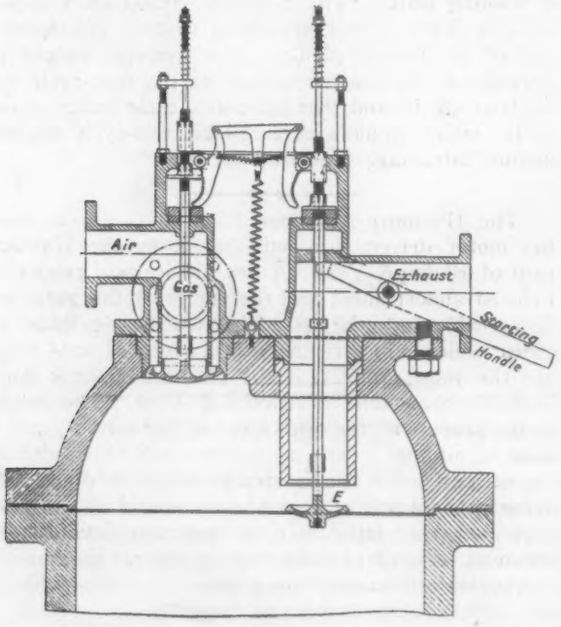


Fig. 5.—Detail of the Latest Form of Interlocking Gas Valve Gear.

when that valve is again raised, which occurs on the compression stroke. The exhaust valve will then be free to open, but cannot do so until the charge in the chamber has expanded to atmospheric pressure.

Since it has been found that water on the spark plug causes no trouble, an ordinary type of plug, as used on automobiles, is now provided, and the spark is produced by a sparking coil and battery similar to those ordinarily employed. The timing gear is very ingenious and yet simple. Its function is to fire the charge at the instant when compression has reached its maximum. It comprises a small piston and cylinder connected to the pump chamber wall so that the piston will move according to the pressure within the chamber. The piston is connected to a steel band passing around a pulley having its other end attached to a spring. Attached to the pulley is a contact lever which plays between two stops, one of which is idle, while the other is alive and closes the ignition circuit. As this piston moves outward, due to compression in the cylinder, it holds the contact against the idle stop, but, with the first slight decrease of pressure within the cylinder, the contact is thrown to the other stop and closes the ignition circuit.

It is evident that the discharge pipe must be of sufficient length to obtain the surging of a certain mass of water, which depends on the head pumped against and the periodicity required. The larger the pipe, and, therefore, the shorter its length, for a given mass of water, the more frequent will be the strokes of the pump and the greater the mass of water the greater can be the head pumped against for a given capacity. In the test of the pump shown in Fig. 4 Professor Unwin found the coal consumption per pump-horsepower-hour to be 1.06 lb., which corresponds to 83.1 cu. ft. of gas per pump-horsepower-hour. A still better performance was obtained with the pump at Dudley Port, which is a counterpart of the one at Brussels. It was tested by Prof. Eugen Meyer. The figures from this test are not yet available, but the builder, the Pump & Power Company, reports that the best results so far obtained have been 73 cu. ft. of gas per pump-horsepower-hour, the thermal value of the gas being 150 B.t.u. per cubic foot, which is equivalent to an anthracite coal consumption of 0.95 lb. per pump-horsepower-hour. The head pumped against was 35.6 ft. and the discharge 3150 gal. per minute. All of these pumps are of relatively low lift, but the inventor has means for increasing the delivery pressure by what is called an intensifier.

An interesting application is now being worked out by German licensees, who are constructing a 1000-hp. pump to show the possibilities of using the principle in the production of power. The pump is designed to put 1¼ tons of water per second under a pressure of 7 atmospheres and the water will be used through a turbine to generate electric current. The plant as a whole, it is declared, will occupy less space than one of the same output run by an ordinary gas engine. Mr. Humphrey has also worked out the problem of compressing air to any required pressure needed in engineering operations and also for the low pressures required in blast furnace blowing engines. The compressor is even simpler than the pump; no water valves are needed, as a constant volume of water is reciprocated between the pump and compressing chamber. It is confidently believed by many who have witnessed the performance of the Humphrey pump that its possible applications for useful purposes are many and that it marks the beginning of a new engineering development, due to the remarkable economy it promises.

The population of Boston is 670,585, as compared with 560,892 in 1900. It retains its position as the fifth American city.

The Fox Two-Cycle Motor

A Unique Engine Having Four Ports

A new type of internal combustion engine has been placed on the market by the Dean Mfg. Company, Newport, Ky., which is known as the Fox two-cycle gasoline motor with fourth port accelerator. This engine as its name indicates has double the number of ports found in the earliest models, but the principal change is the addition of the fourth port as two-cycle engines with three ports are now common. Fig. 1 shows the exterior of the three-cylinder engine, while details of its interior construction are given in Fig. 2.

When first introduced the two-cycle engine operated with only two ports, the fuel being admitted to the crank case from the carburetor through a check valve, which prevented the return of the mixture when under compression. The next improvement was the addition of a third port, which has met with such success that it has been generally adopted. The fourth port added on the side of the Fox motor cylinder is intended to admit fresh air, and is so arranged as to be uncovered near the end of the compression or upward stroke of the piston. This air is deflected into the cylinder, while at the same time the fuel charge is deflected into the lower port of the crank case. On the downward stroke of the piston, the fourth and third ports are covered in the order stated and the fuel in the crank case is compressed. The piston has now traveled to nearly the end of the down stroke, and at this point the by-pass between the crank case and cylinder is uncovered by the top of the piston. The fresh air admitted is deflected into the cylinder in advance of the fuel charge, and as the exhaust port is uncovered and the exhaust gases rush out of the cylinder, this air serves to scavange the cylinder. If any of the charge passes through the exhaust, it will be a portion of the fresh air before the fuel charge is admitted, and it is claimed that this arrangement effects a saving of at least 10 per cent. in fuel over the regular two-cycle, three-port motor.

It is further claimed that with the fourth port extreme flexibility of control is obtained, due to the fact that the amount of air passing the needle valve in the carburetor gives a constant mixture under all conditions. Provision is made for throttling this mixture and for the addition of air before it is admitted through the third port. The engine is generally brought up to speed before the fourth port is opened. The levers connecting the throttle and those regulating the carburetor are all attached to one handle, and when once properly regulated it is not necessary to change their relative positions.

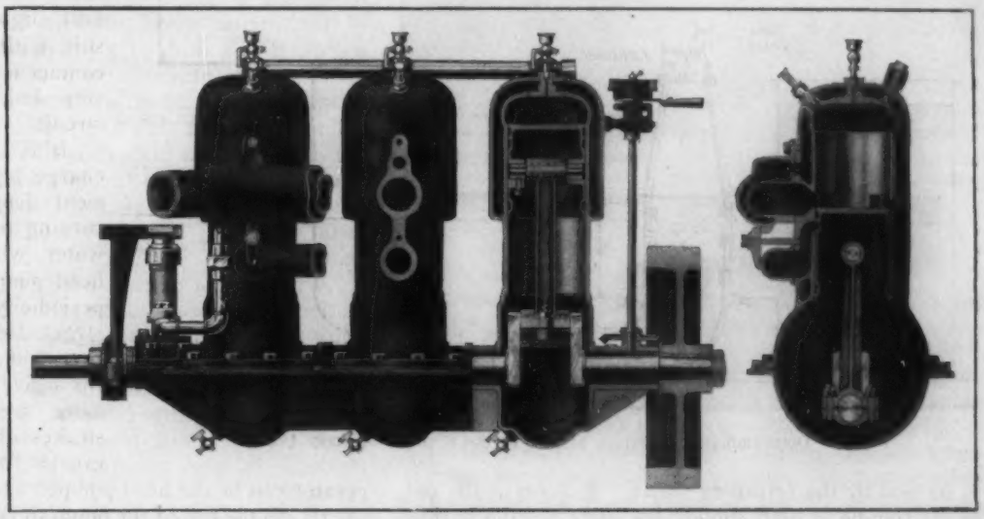


Fig. 2.—Side Elevation of the Engine with One Cylinder in Section and Cross Sectional Elevation.

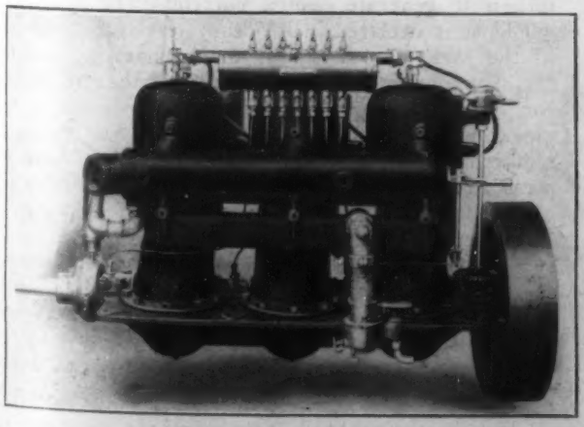


Fig. 1.—A Three-Cylinder Fox Two-Cycle Motor with Fourth Port Accelerator, Built by the Dean Mfg. Company, Newport, Ky.

The Dean Mfg. Company is also building a four-port aero motor, which develops a speed of 2400 rev. per min., and has four 3½ x 3½ in. cylinders. The total weight is 178 lb., of which 134 lb. is the engine, while the balance is magneto, radiator, fan and 12 lb. of cooling water. The Scientific Aeroplane Company of New York is now arranging to test this motor in one of its Bleriot planes. The average weight per horsepower for marine motors of the four-cycle type is about 48 lb., and that for a two-cycle motor is only 30 lb., which would give a reliable two-cycle engine a distinct advantage for aeroplane use.

The Hamburg-American Line is having an 8000-ton motor driven ship built for it by the Hamburg firm of Blohm & Voss. A new device will render the exhaust almost silent and the fumes of the gases will be invisible and odorless. The two three-cylinder engines, which will give the ship a speed of 12½ knots, are the joint product of the Maschinenfabrik Augsburg-Nürnburg and of Blohm & Voss. The residue in the process of the refinement of the oil only will be used as oil fuel. Only 27 persons will be needed for the oil engines, while in steam vessels of similar size about 250 stokers and coal drawers would be employed. Moreover, the motor liner, by space conservation thus obtained, can carry 2000 tons more cargo than her steam rival of similar dimensions.

The International Vanadium Company, Ltd., 49 and 51 The Albany, Liverpool, England, whose American agent is the General Vanadium Company of America, 1502 Continental Building, Baltimore, Md., is distributing a reprint from the London *Iron and Coal Trades Review* on "The Selection of Steel for Locomotive Construction." The article is by W. L. Turner, a director of the company, who writes most interestingly regarding the possibilities of vanadium in the manufacture of alloy steel, giving the results of tests which have recently been made.

Steam Turbines for Both High and Low Pressure

Details of the De Laval Mixed Flow Type

There are remarkable possibilities in the use of exhaust steam or other low pressure steam for producing power in steam turbines. The temperature ranges between steam at ordinary boiler pressures, as 150 or 175 lb. gauge, and steam at atmospheric pressure, and between steam at atmospheric pressure and steam under a 28-in. vacuum, are approximately equal, as are also, therefore, the percentages of heat which can be converted into work between the two sets of limits. Consequently if a high pressure noncondensing engine and a low pressure turbine operated within these two

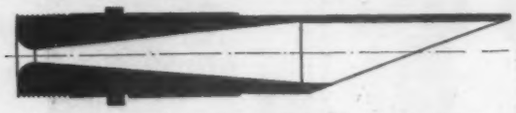


Fig. 1.—Nozzle Used in the High Pressure Turbines Built by the De Laval Steam Turbine Company, Trenton, N. J.

ranges are equally efficient, each will develop about the same amount of power per pound of steam.

If expansion ratios are taken into consideration the same relations appear. When steam expands adiabatically from 150-lb. steam gauge pressure to atmospheric pressure, the volume increases about 8.3 times, while

Fig. 2.—De Laval Steam Nozzle for Low Pressure or High Pressure Noncondensing Service.

in expanding from atmospheric pressure to 28-in. vacuum, the volume increases about 11.65 times. These ratios do not hold exactly for steam expanding in a cylinder on account of condensation and reevaporation, but the agreement is close enough for the purpose of the present illustration. Each 3 degrees F. added to the temperature range at the condenser end increases the power obtainable from a pound of steam by about 1 per cent. In expanding from 28 in. to 29 in. vacuum (referred to a 30-in. barometer), the volume is approximately doubled.

The reciprocating engine is not capable of realizing the fullest advantage of expanding steam through the lower range of pressure, since to turn the heat of the steam into work as efficiently in the range below atmospheric pressure as above, the ratio of expansion of the engine would need to be squared. In other words, if this ratio of a compound engine is 10 when exhausting to atmosphere, it would be over 100 when exhausting to a 28-in. vacuum, which would call for cylinder volumes that are practically impossible. On the other hand, a high ratio of expansion is easily attainable in the steam turbine, which, as it is also free from losses due to alternate heating and cooling of metal surfaces, is a most efficient low temperature heat motor.

A realization of the above facts has drawn the attention of engineers to the steam turbine and its possibility of increasing the capacity and efficiency of existing steam engine plants by using their exhaust, or, in other cases, of using the vapor, which can be generated by reheating furnaces, kilns, &c., or the exhaust from various processes where water vapor is produced in large quantities at a low temperature and pressure.

To produce the high pressure steam required by the reciprocating engine, boilers, chimneys and furnaces are expressly installed, usually having nothing else to do, and can be depended upon to supply steam uninterruptedly. On the other hand, low pressure steam is usually a by-product from other processes and may be either continuous or intermittent. The discontinuity in the supply may vary from the pulsating exhaust of reciprocating engines to the periodic exhaust of rolling mill or winding engines, the erratic delivery of air compressors and steam hammers, the occasional blowing off of digesters, and so on to cases where low pressure steam is available only one-half the year, as where the exhaust of the engines is wanted for steam heating during the winter, and it is desired to improve the economy of the plant by utilizing the exhaust steam for power production during the summer.

As the power which the low pressure turbine will produce is generally wanted continuously, some means

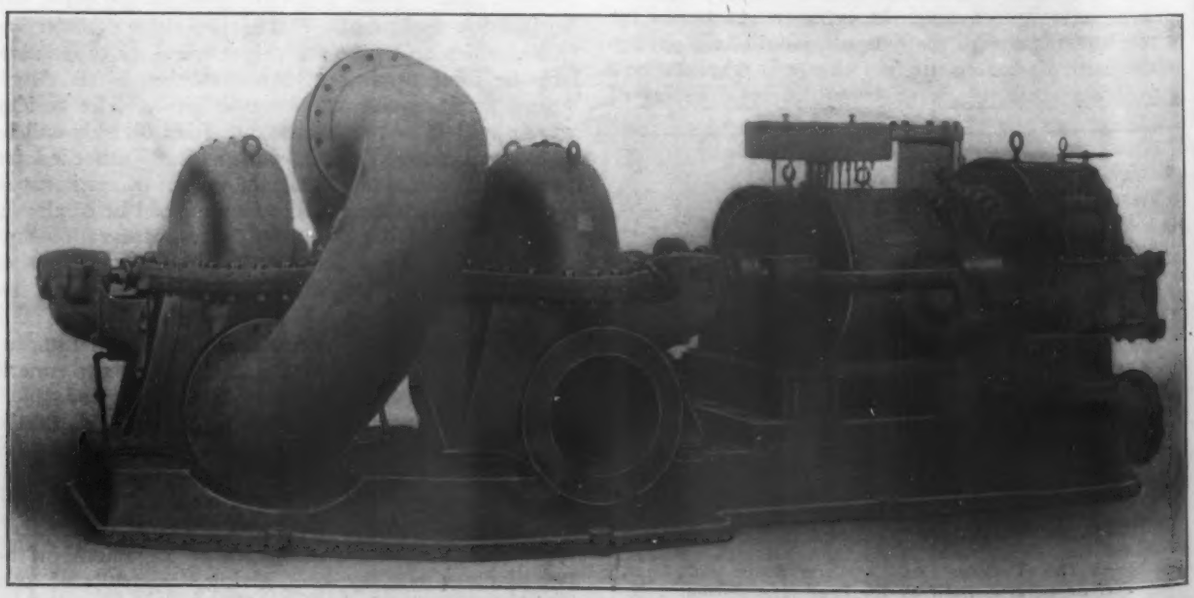


Fig. 3.—Low Pressure De Laval Turbine Direct Connected to Two 13-In. Centrifugal Pumps.

must be found for supplying steam to the turbine during the periods when the waste low pressure steam is not at hand. For short periods this difficulty may be overcome by using regenerators, while for longer ones recourse must be had to live steam. This can be used in two ways; either the pressure of the live steam can be reduced to that at which the turbine is intended to operate, or the turbine can be so designed that both high pressure and low pressure steam can be used in it efficiently.

It is one of the peculiarities of all types of steam turbines that the nozzles and passages in which expansion of the steam takes place can be designed for efficient operation at only one ratio of expansion. In the compound reaction turbine the number of rows of blades and the pressure drop per stage must be proportioned to the range of pressure within which the turbine is intended to operate. If it is desired to operate with two pressure ranges, two ratios of expansion must be provided for. This is generally done by admitting the low pressure steam at an intermediate stage, allowing it to expand through the long blades of large area at the low pressure end of the turbine, while when high pressure steam is used it is introduced at the high pressure end of the turbine and is allowed to expand through the entire series of blades. With this arrangement, the high pressure end of the turbine runs idly in the steam during the periods when no high pressure steam is being used, and thereby wastes considerable power. Moreover, a mixed flow turbine of this type is practically as costly and complicated as a high pressure turbine, whereas otherwise the low pressure turbine should cost much less, due to the fewer rows of blades required for the expansion of low pressure steam. If the turbine is of the graduated velocity type, the same considerations hold. To utilize high pressure steam efficiently, a high pressure section must be provided, which, so long as no live steam is being used, is only a drag on the remainder of the turbine. The expedient of reducing the pressure of live steam through a reducing valve for use in a low pressure turbine is not profitable if it must be supplied for any length of time. It might even be better in such cases to have two turbines, one for the live steam and one for the exhaust steam.

These difficulties in connection with using two steam pressures are avoided in the single stage impulse turbine, built by the De Laval Steam Turbine Company, Trenton, N. J., which is illustrated herewith. In this turbine the complete expansion of the steam takes place in a single nozzle. Steam entering at full pressure expands in the nozzle to the final or condenser pressure, thus converting all the heat energy available between the two temperature limits into energy of velocity. In correctly designed nozzles the efficiency of this conversion may exceed 95 per cent.

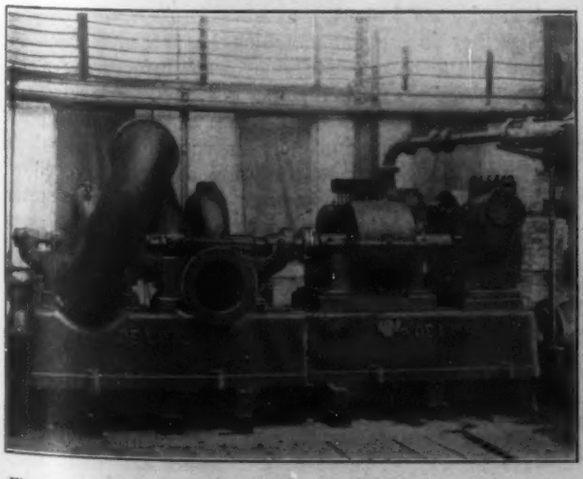


Fig. 4.—A De Laval Mixed-Pressure Turbine Connected to Two Centrifugal Pumps, Arranged for Series or Parallel Operation.

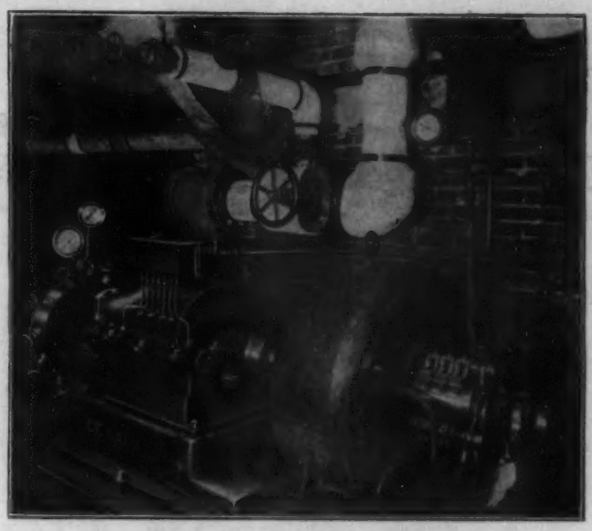


Fig. 5.—A 55-Hp. Low-Pressure Turbine Used for Generating Electricity from Exhaust Steam in a Large Ice Plant.

A nozzle designed for receiving high pressure steam and exhausting into a condenser is shown in Fig. 1, while a nozzle for receiving exhaust steam and discharging into a condenser, or for receiving live steam and discharging against atmospheric pressure, which involves about the same expansion ratio, is shown in Fig. 2. A nozzle of which the minimum diameter of throat opening is ½ in. will develop 75 hp. when receiving steam at 125 lb. pressure and exhausting into a 27-in. vacuum. It is thus possible, by utilizing the full periphery of the wheel to place a sufficient number of nozzles of various ratios of expansion to suit a variety of conditions.

It might seem that a mixed flow turbine of this type would be a compromise and that the efficiency when operating on either high or low pressure would be sacrificed, since the velocity of steam issuing from the nozzle would be different in the two cases, while the velocity of the wheel must remain the same. However, the proportion of the total work abstracted from the steam is not much different in the two cases. The heat set free by a pound of steam expanding from 150-lb. gauge pressure to 2 lb. absolute is 225,620 ft.-lb., corresponding to a steam velocity of 3710 ft. per second. If the periphery of the wheel runs 1500 ft. per second and the angle of entrance and exit of the steam is 20 degrees, the velocity of the steam leaving the bucket will be 1330 ft. per second, and the proportion of the total energy converted into useful work 81 per cent. Taking steam at 15 lb. absolute pressure expanded to 2 lb. absolute, the available work is 101,900 ft.-lb., which gives a steam jet velocity of 2480 ft. per second. With the same rim velocity and angles as before, this gives an absolute velocity of the steam leaving the buckets of 846 ft. per second and the conversion into work of 88.7 per cent. of the energy originally in the steam. The above comparison is based upon unit efficiency of nozzles and blades, and in practice the figures are reduced somewhat by eddy and friction losses, but the relative values remain substantially the same. Thus a wheel speed suitable for one ratio of expansion will serve fairly well for all other ratios encountered in high or low pressure work, it being necessary only to modify the nozzles to obtain the best conditions.

A machine in which all these possibilities have been utilized is shown in Fig. 3. This turbine, which develops 150 hp. for two 16-in. centrifugal pumps, was installed in a large steel mill to receive the exhaust from a number of hydraulic pressure pumps and other auxiliary machines, all exhausting into a common header. The turbine exhausts into a large central condensing plant, serving a number of rolling mill engines,

where the vacuum varies from 18 to 27 in., the average being about 22 in. There is also a possibility of losing this vacuum entirely at times, due to engine troubles or to air leaks, making it necessary to operate the turbine noncondensing. The requirements of the specifications, which were fully met under test, were to carry full load when using steam at atmospheric pressure, exhausting into a vacuum of 22 in., and also when receiving steam at 120 lb., and exhausting into a vacuum of 22 in.; also to operate condensing with steam at 90 lb. pressure, exhausting into a vacuum of 22 in., and in an emergency to operate noncondensing with steam at 90 lb. pressure, all changes to be carried out automatically by the turbine itself, with the exception of the change to the noncondensing condition.

The turbine is fitted with two governor valves and two governors, one for high pressure and one for low pressure steam, the former being set at a few revolutions below normal speed and keeping the high pressure valve tightly closed above this speed. The low pressure governor is set for normal speed, but on the failure of the low pressure steam supply, the machine will drop a few revolutions, whereupon high pressure steam is admitted to the high pressure nozzles. At the same time the low pressure nozzles continue to utilize any exhaust steam available, the pressure limits varying in practice from 2 lb. above atmosphere to a 5-in. vacuum. To guard against the turbine running away, in case the high pressure valve should leak when the turbine was lightly loaded, an emergency stop is provided, consisting of a butterfly valve in the exhaust pipe controlled by a piston, but normally held open by a spring. In case of excessive speed air is admitted behind the piston, closing the butterfly valve. As soon as the speed is normal again the governor closes the air valve and air leaks into the vacuum, the butterfly valve in the exhaust pipe again restoring normal conditions. As will be seen, this involves no interruption of the condenser service, as does the usual vacuum breaking device.

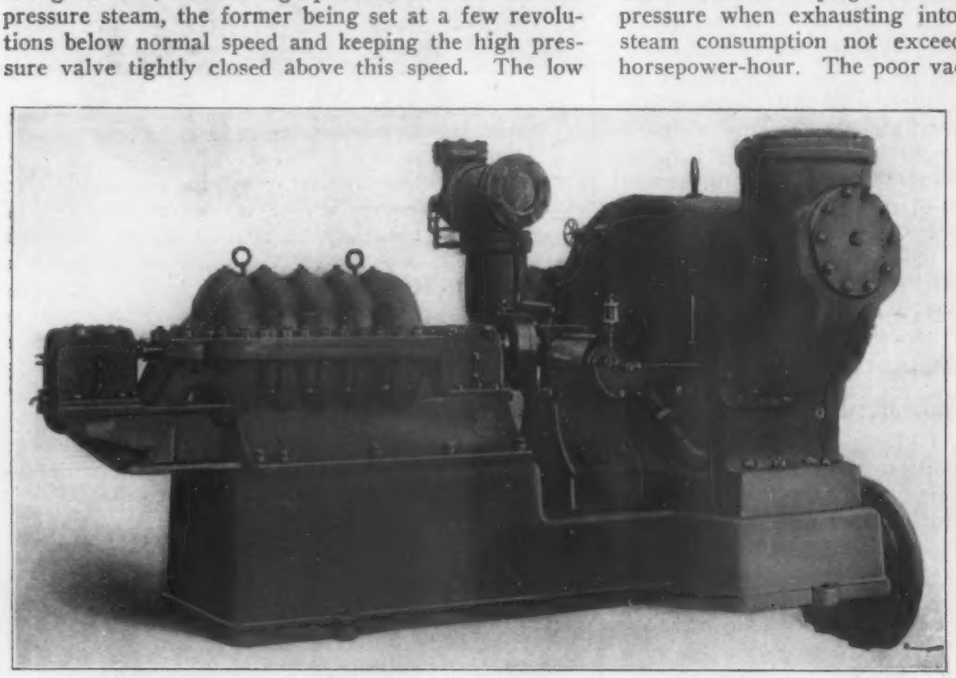


Fig. 6.—De Laval Turbine Connected to a Pump Delivering 500 Gal. Per Minute Against a 1400-Ft. Head.

Another machine, adapted to a wide range of conditions, is shown in Fig. 4, the pumps in this case being arranged for use on two different water systems, as desired.

The steam consumption under various operating conditions is given in the following table:

Steam pressure.	Vacuum in inches.	Pounds of steam per brake hp.-hr.
1¼	26	32
1¼	28	30
120	26	19.2
120	28	17.5

The turbine is also required to run with 100 lb. steam pressure noncondensing. It drives two pumps delivering 7300 gal. at 140-ft. head or 14,600 gal. at 70-ft. head with a pump efficiency of over 76 per cent., corresponding to a duty of 86,000,000 ft.-lb. per 1000 lb. of steam when running under full steam pressure and vacuum and to a duty of 47,000,000 ft.-lb. when using exhaust steam. The De Laval Steam Turbine Company is building two more units with the pumps arranged for series operation only.

An interesting application of low pressure turbines is illustrated in Fig. 5. This little machine is installed in an ice plant, receiving the exhaust from the ammonia compressors and driving a 35-kw. Crocker-Wheeler direct current generator supplying current for lighting and for operating two elevators, a machine shop and a coal elevator. The load is very fluctuating. The turbine develops 30 kw. with steam at atmospheric pressure when exhausting into a 25-in. vacuum, the steam consumption not exceeding 45 lb. per brake horsepower-hour. The poor vacuum obtainable in this case is explained by the fact that the circulating water used in the condenser serving the turbine has already been warmed to a certain degree by passing over the ammonia condensers. When receiving steam at 95 lb. pressure and exhausting into a 25-in. vacuum the unit is able to develop 35 kw. with a steam consumption of 28 lb. per electrical horsepower-hour. When running noncondensing the steam consumption is 43 lb. per brake horsepower-hour. Incidentally the exhaust from this turbine after condensation is used for ice making, the absence of oil rendering it perfectly suitable for such purposes.

The turbine shown in Fig. 6 differs from the others described as the impellers of the directly connected centrifugal pumps run at the same speed as the impulse wheel of the turbine itself. This unit operates with steam at atmospheric pressure, exhausting into a 24-in. vacuum, or with 120 lb. of steam, exhausting into the same vacuum, or running noncondensing. The pump delivers 500 gal. per minute, against a 1400-ft. head, and is used in connection with the hydraulic system of a steel plant.

Another interesting machine has recently been installed in the power station of a manufacturing plant. It is a mixed pressure turbine, designed to develop 350 hp. when receiving exhaust steam at 2-lb. gauge pressure and exhausting into a 27-in. vacuum, under which conditions the steam consumption does not exceed 31 lb. per brake horsepower-hour when receiving steam at 140 lb., and exhausting into a 27-in. vacuum on a steam consumption of 18.5 lb. per brake horsepower-hour, 300 kw. is developed, which, considering the size of the unit, is very good.

A mixed flow turbine of this type is especially advantageous where it is desired to increase the output of an existing plant, and where steam is required for heating or drying purposes as well as for power production. A manufacturing plant, for instance, of moderate size may at present be running noncondensing, using the exhaust steam for drying purposes and for heating the shops during the winter. If more power is

required, two courses are open; either the present power equipment can be increased by adding boilers, stacks and engines, or a low pressure turbine can be installed to use the exhaust of the present engines, thereby increasing the output of power even to double the original amount. This, however, would deprive the plant of all or part of its exhaust steam, but if the exhaust steam turbine is of the type herein described it can be arranged to take only the surplus of exhaust steam from the heating system during the winter months, drawing upon the boiler for the live steam required to make up its full quota of power. Or, if the demand for exhaust steam during the winter is greater than the engine can furnish the turbine can be converted to back pressure service, receiving live steam from the boiler and exhausting into the heating system. This would be more economical than operating the turbine on the exhaust steam and drawing live steam through the reducing valve for the heating system.

The auxiliary power required for the condensing plant of an exhaust turbine is small, the current consumed by the electrically driven auxiliaries amounting to not more than 3 per cent. of the current developed by the turbine itself. Due to the possibility of shutting off nozzles as the load decreases, the above type of turbine has a flat efficiency curve, giving remarkably good performance even at quarter load. This efficiency is retained indefinitely, as there is no leakage past valves or piston rings due to wear.

Connellsville Iron Works Under New Management

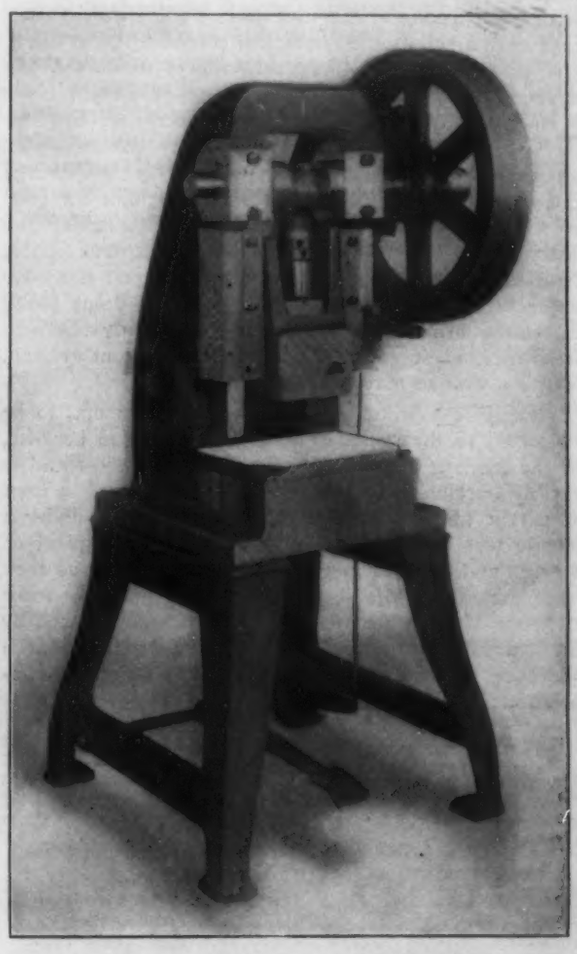
W. E. Kelly has recently been appointed general manager of the Connellsville Iron Works, Connellsville, Pa., succeeding J. Whitaker, resigned. J. T. Miller, the former superintendent of the company, is again with the Scottdale Foundry & Machine Company, Scottdale, Pa., having charge of its structural shop. The Connellsville Iron Works is completing two coke works machines, consisting of an electrically operated leveler and pusher, for the Pittsburgh-Westmoreland Coal & Coke Company's plant at Bentleyville, Pa., comprising 400 new rectangular coke ovens. The company states that it will continue the manufacture of iron and steel plate work for coal and coke plants and mills, steel cars for mines and industrial uses, tanks and stacks, and in addition will also make a specialty of repairing boilers of all kinds. It will also continue its business of repairing castings, such as rolls, pinions, gear wheels, pump parts, &c., by its own secret process of brazing that has proved very satisfactory, one recent contract being the repairing of several large housings for a sheet mill which are in regular use at this time but that ordinarily would have been scrapped after becoming broken.

The E. & G. Brooke Iron Company, Birdsboro, Pa., has resumed operations in several departments of its plant. Six scrap furnaces and two puddling furnaces, which had been idle since May, were recently put in operation. The plate mill department, with three heating furnaces, resumed at the same time, after being idle for a month. This company has recently taken orders for a considerable quantity of wrought iron grooved skelp, which will keep it actively engaged for some time.

According to calculations of Henry Steinzer, official statistician of the New York Produce Exchange, crops of corn and oats will be the greatest on record, although corn will fall just below the coveted 3,000,000,000 mark. Spring wheat has made a rapid recovery, so that the total crop will be a fair average and almost 45,000,000 bushels greater than the July estimate.

The Baird Open Back Press

A new and heavy design of press with an open back has been placed on the market by the Baird Machine Company, Oakville, Conn., to meet the demand for a machine for doing heavy blanking and stamping. Some of the special features embodied in the design of this press are the long slide, the strong support provided for the bearings, the heavy balance wheel and the convenient location of the foot treadle and the hand lever for operating the clutch mechanism.



The New Heavy Blanking Press, Built by the Baird Machine Company, Oakville, Conn.

Although the machine shown is a plain press, several unique attachments have been designed that can be applied when necessary. With this end in view finished seats have been provided which make the application of the attachments comparatively easy. In this way a purchaser can first obtain a plain press, and if later on either the back or side roll feed attachment or the dial attachment is found desirable, these can be applied at that time without the necessity of shipping the press to the factory, as the attachments are regularly carried in stock. Four sizes of press are built, that shown in the illustration being known as the No. 3H.

A German edition of Thomas D. West's "American Foundry Practice" and a French edition of Mr. West's "Molders' Text Book" have recently been published. The former is 7 x 9 in. and contains 625 pages. The translation is by Ernst A. Schott and the publisher is Hermann Meusser, Berlin. The latter is 5½ x 8½ in. and has 209 pages. It is translated by Par P. Aubie and published by Gauthier-Villars, Paris. The French work contains only the portions of the "Molders' Text Book" treating of cupola practice.

The Elastic Limit of Bronzes*

The Danger of Confusing It with the Yield Point

BY J. A. CAPP, SCHENECTADY, N. Y.†

To keep up with the demands upon the laboratory for more work in a given time, testing machines have been speeded up and the slow extensometer has largely been displaced by dividers, used either unchanged or with some means of magnification. To represent castings and forgings the short test piece ½ in. in diameter and 2-in. gauge length is almost universal. As a consequence, while reports of tests usually include a statement of elastic limit, the property of the material actually determined is in reality that more or less vague value called the yield point. It is the object of this paper to show that while the yield point for steel is so well marked in properly conducted tests, and bears a sufficiently definite relation to the true elastic limit to warrant the dependence placed upon it by the engineer, there is no equally well defined point found in testing bronzes, and the value commonly obtained from rapid commercial tests as the elastic limit or yield point on bronze may be quite misleading.

Manganese bronze was selected as the metal to be subjected to the series of tests here recorded because, of the modern alloys, it is one of the strongest and is readily obtainable in the market. This metal is used as a type and the results, so far as behavior under a tensile test is concerned, may be taken as typical of brasses and bronzes in general, at least so far as they have come under the observation of the author in some 17 years of testing materials. Specifications issued by the Navy Department for manganese bronze, March 30, 1909, required the following approximate composition:

	Per cent.
Copper	52
Iron	1
Zinc	46
Tin	1
Manganese	Trace
Aluminum	0.5

The specification further required:

Tensile strength	65,000 lb. per sq. in.
Elastic limit	30,000 lb. per sq. in.
Elongation	15 per cent. in 2 in.
Reduction of area	25 per cent.

They state "the elastic limit is to be the yield point, measured by the drop of the bar."

Manganese bronze castings in the form of cylindrical bars about 1½ in. in diameter by 24 in. long, were ordered from several foundries supplying this alloy; the orders were placed through the regular channels, bars of about this size being required in ordinary production. In this way it was hoped that commercial material would be obtained, such as might be expected in castings of more intricate shape. The results on these specimens, ordered without reference to intended use, checked very well with those upon samples submitted previously by the same parties, especially for the purpose of showing the qualities of their material. To indicate the effect of working upon the metal, there were also ordered two bars of the same dimensions hot rolled to size, and two bars hot rolled and cold drawn. The effect of the cold drawing was lost to a great extent by the necessary turning off of the surface in preparing the specimen for test. Much of the cold drawn metal is used in this way, however, when screw threads are required to provide means of fastening the part in place in the structure. From the bars so obtained, specimens were turned which provided a test section 1 in. in diameter by 8 in. between gauge marks, and which had, for the purpose of gripping, ends 1½ in. in diameter threaded to fit the nuts required by the testing machine.

Some of these specimens were pulled in the laboratory of the General Electric Company at Schenectady, some in the testing machine at the United States Arsenal at Watertown, and others in the laboratory of the Halcomb Steel Company at Syracuse. The tests in the Halcomb laboratory were made to obtain autographic strain diagrams; the other tests were made with an extensometer.

In the tests with the extensometer, after the instrument had been placed, an initial load of 1000 or 2000 lb. per square inch was applied and the first reading taken; readings were then obtained at successive loads applied in equal steps. In some cases, the readings were continued regularly until the increase in extension per increment of load was so great that there was no doubt that the strain diagram had departed markedly from the straight line demanded by Hook's law; in other tests, the normal succession of readings was continued only until the first positive increase in extension per increment of load was noted, when the stress was reduced to the initial load for the measurement of permanent set, after which the load was returned to the value just left, a new reading taken and the test continued with further determinations of set intervals. The values of stress and corresponding strain obtained were plotted, and the elastic limit

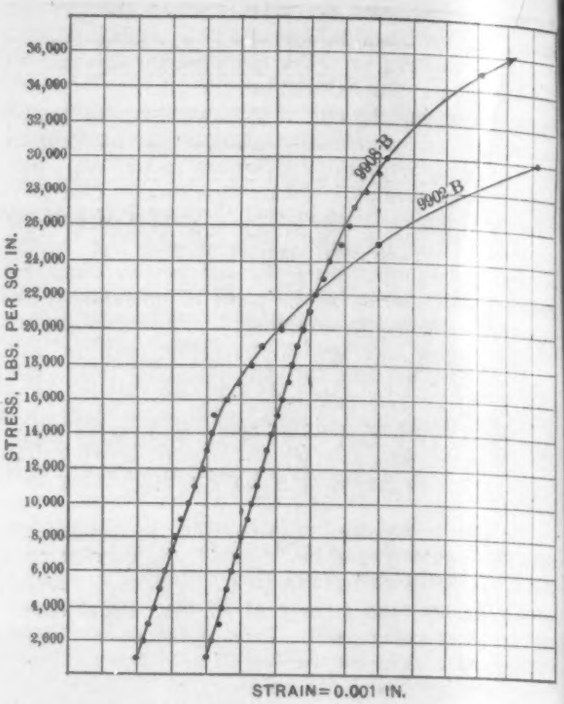


Fig. 2.—Curves of Results of Test at the Watertown Arsenal.

* Presented at the Spring meeting of the American Society of Mechanical Engineers, Atlantic City, May 31-June 3. For discussion of this paper see the report of this meeting printed in *The Iron Age*, June 9, 1910.

† Chief of Test Laboratory, General Electric Company.

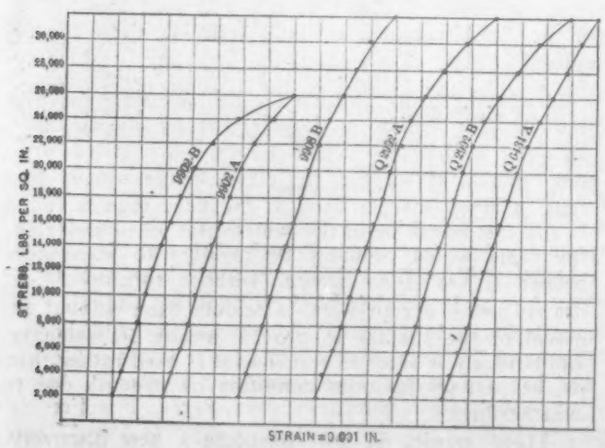


Fig. 1.—Curves of Results Obtained from Tests Made at Schenectady.

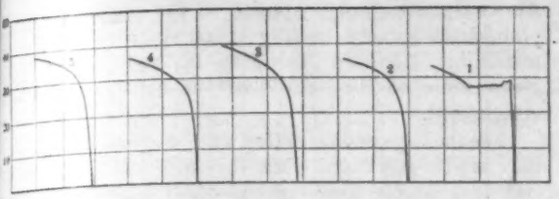


Fig. 3.—Autographic Strain Diagram Corresponding to Results of Tests Made at the Halcomb Steel Company's Laboratory, Syracuse, N. Y.

recorded as the stress at the point of inflexion of the curve drawn through the points.

The specimens subjected to these tests were about 12 in. long over all. From the remainder of the 24-in. bars, the usual ½ x 2 in. test pieces were turned and tested in the customary commercial way, using a pair of multiplying dividers to indicate the point of increase in rate of stretch or yield point.

The curves for all the tests made at Schenectady are assembled on Fig. 1. The curves from the tests at the Watertown Arsenal are given on Fig. 2, and the results of the work at the Halcomb laboratory are shown in Fig. 3; the scale of the diagram is so small that the location of the point of inflexion is uncertain within about 2000 lb. actual load. The multiplying dividers used in the commercial tests here recorded magnify the movement of the gauge marks about 10 times, and are a much more sensitive instrument than the machinists' dividers for locating the yield point; hence, the yield points recorded are lower than are usually reported.

In text books and elsewhere, the limit of elasticity is defined as that value of stress beyond which there is not full recovery of the initial dimensions or shape of the specimen after release of the load, or as the maximum stress that can be applied without producing permanent set. In other words, it is the value of stress beyond which Hook's law no longer holds, and it is sometimes spoken of as the limit of proportionality of stress to strain. Accepting this definition it is seen that its value in the bronzes tested is from 16,000 lb. per square inch to 23,000 lb. per square inch, whereas the yield points found for the cast metals ran from 25,000 to 29,000 lb., and for the worked metals, from 30,000 to 44,000 lb. per square inch. Had ordinary dividers been used, the values for the cast metals would have been placed between 30,000 and 40,000 lb. per square inch. The strain diagrams from the extensometer tests show the general shape of the elastic curve of the metal, and permit the accurate fixing of the point of inflexion of the curve; the autographic diagrams, however, show not only the actual shape of the curve, but also why there is the uncertainty in the locating of the yield point or point of rapid increase in rate of stretching.

For comparison, the autographic diagram of a piece of commercial "structural medium" steel is shown as No. 1 in Fig. 3. At the scale of the diagram, no inflexion of the curve is seen until it suddenly breaks sharply, actually drops and remains practically horizontal until it finally picks up again. This jog is entirely characteristic of mild steel, and is found to a more or less marked extent in all steels, save perhaps the very hard varieties. There is, however, no break of any sort in the curves obtained from bronze; they are entirely smooth. Somewhere along the knee of the curve, the tester notes that the material is stretching faster; just where he notices it will depend upon the sensitiveness of the means employed to indicate stretch, and upon his skill and sharpness in observation. The jog in the steel curve is indicated simultaneously by the slipping of the dividers and by the dropping of the scale beam of the testing machine driven at constant speed. The scale beam does not drop when testing bronze; the operator finds the poise gradually traveling more slowly to maintain balance, but who can say when the change in rate began?

Halcomb Steel Company Tests.

Autographic Tests All Specimens 1-in. (Approximate) Dia. by 8 In. Long.

Number on curve sheet	1	2	3	4	5
Sample	Steel.	Cast.	Cast.	Hot Rolled	Cold Drawn.
Reduction of area, per cent.	53.6	8.3	14.1	53.2	38.6
Elongation, per cent.	36.3	27.2	6.6	34.4	25.2
Elastic limit, lbs. per sq. in.	38,000	21,400	22,900	22,800	25,200
Tensile strength, lbs. per sq. in.	60,140	69,700	63,940	71,820	68,500

It is customary to find the yield point in mild steels, and, in fact, in annealed steels generally, at about 50 per cent. of the maximum strength. The yield point in mild steels corresponds, for all practical purposes, with the elastic limit. As the steel becomes harder, due to increase in carbon or the addition of alloying metals, or to heat treatment, the yield point rises rather more rapidly than the elastic limit, although the difference between the two is not so great, but that the former may be used in calculations, and the yield point itself is less sharply marked, though still observable if sufficient care is taken. The yield point in steel is accepted as a safe guide to the engineer, in deciding upon the maximum stresses that may safely be permitted in parts designed to carry load.

That no such dependence can be placed upon the so-called yield point, as it is determined upon bronzes, is evident; rather, recourse must be had to the slower but more accurate determination of the true elastic limit if safe data are desired. It is especially noteworthy that the sets found at the minimum values of yield point as usually reported are a very considerable proportion of the total stretch that has taken place in the metal at those stresses, and that sets are found at stresses which are but 40 to 50 per cent. of these reported yield points. Under certain conditions of dead load, a stress of 75 per cent. of the elastic limit is sometimes considered at least not unsafe; if such a load were calculated for bronze, upon the basis of the usual commercial test for yield point, instability of the part so designed would be inevitable.

Hot working of the metal has not materially improved its elastic properties, but has greatly increased its toughness, and probably in an extended series of tests, would have been found to impart uniformity. It is well known that this particular alloy is relatively difficult to handle in the foundry because of its sensitiveness to temperature of pouring and to changes in composition, at least in the sense of impurities in the constituent metals, and because of its great shrinkage, requiring large feeders and sink heads. As in other copper alloys, many of the ill-effects of this sensitiveness may be largely overcome by hot working. The data here presented are too meager to warrant lengthy discussion of the effects of cold working of the metal; it is shown that in the case of bars of 1½ in. in diameter, the effects of the cold drawing may have largely disappeared when ¼ in. of metal is removed, except as shown in a lessened elongation. Neither hot or cold working cause any change in the elastic curve of the metal; it remains a characteristically smooth curve. In other cold drawn copper alloys, when tested without removal of surface, the elastic curve usually presents a much sharper bend at the knee than is found in the cast metal, or in the same metal when annealed; the same would probably be found with manganese bronze if tested as drawn, without turning. Cold drawn metal, except wire, is seldom used without removal of the surface to provide means of fastening, and it surely is safer to test it as it is used rather than in the perhaps fictitious condition of strength due to skin hardness.

These results do not constitute a new discovery. In the literature of testing engineering, references may

be found with direct bearing on the subject; but in these days of rapid progress and short cut methods, much that is old, or that may be found only by search, is apt to be forgotten or overlooked. Comparatively few laboratories have autographic machines, and the use of the extensometer with a specimen only 2 in. long is not very satisfactory because of the small extension of so short a length of material under stress. Many otherwise well equipped laboratories have no extensometer. So much of experience in testing materials is based upon work done upon iron and steel that it was perhaps a natural assumption that the characteristics of these metals would also be found in bronzes and similar alloys and hence that methods of testing used successfully with one would yield equally safe results when applied to the other. Test results which are misleading are exceedingly dangerous; they induce a false sense of security which may result in the failure of structures and lead to the condemnation of a material which would be perfectly satisfactory if properly applied and not unwittingly abused.

The Garvin Four-Spindle Vertical Indexing Attachment

For use in milling the wrench holds on spark plugs and similar work the Garvin Machine Company, Spring and Varick streets, New York City, has placed on the market a four-spindle indexing attachment. Fig. 1 shows the attachment applied to the company's No. 2 plain back geared milling machine, which was illustrated in *The Iron Age* May 16, 1907, while Fig. 2 gives some of the details of the construction of the attachment.

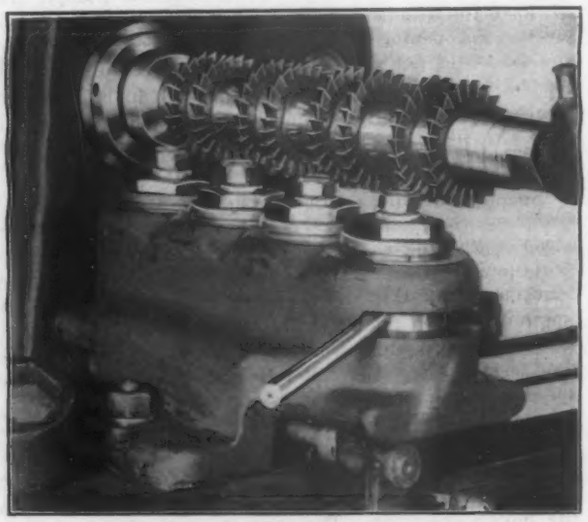


Fig. 1.—A Four-Spindle Vertical Indexing Attachment for Milling Machines, Made by the Garvin Machine Company, New York City.

The hexagons are milled on the spark plugs before they are threaded and while they are held by the smooth end, in a double cone tapered collet which is tightened by a wrench. The spindles on the lower end are all geared together so that one indexing by the lever projecting from the base of the fixture is sufficient for all four. When the work is completed the collets are loosened, and returning the table operates the ejecting lever, shown at the lower left corner of Fig. 2, forcing the pieces from the fixture. Any dirt or chips which may pass down through the holes in these bushings falls through the ejector plug, which is hollow, to the recess just above the slide; this construction is clearly shown at the right of Fig. 2.

The way in which the spring collet is tightened and loosened is also illustrated in Fig. 2, where the right spindle is shown sectioned. The handle shown broken in the upper left corner is the one which indexes the spindles simultaneously and in Fig. 1 projects from the base of the fixture. The boss, a little to the right of this lever and under the left spindle, exposing a screw head, contains the spring and lock pin plunger which works into the next spindle to the right. This contains as many holes for the plunger to enter as the number of divisions to be made. This attachment is bolted to the table of the milling machine and can be applied to one of any make.

The Osborn Core Sand Washing Machine

In every foundry considerable is spent for core sand, not so much because of the quantity required as due to the fact that after it has been used it is generally discarded as unfit for further use. To reduce this item of expense would be very desirable, and with this end in view the Osborn Mfg. Company, 5401 East Hamilton avenue, Cleveland, Ohio, has developed a machine for washing the core sand and rendering it fit for indefinitely repeated use. This washer, which is illustrated herewith, is said to be the only one of its kind on the market at the present time.

The machine, known as the No. 13 core sand washer, consists of a cylindrical drum 48 in. long by 34 in. in diameter where the sand is washed, together with a feeding hopper and an outlet. Sand is fed into the drum, which has a capacity of 16 cu. yd. of black sand per day, and mixed with the wash water in the proportion of 10 gal. to 1 cu. ft. of sand. The drum is

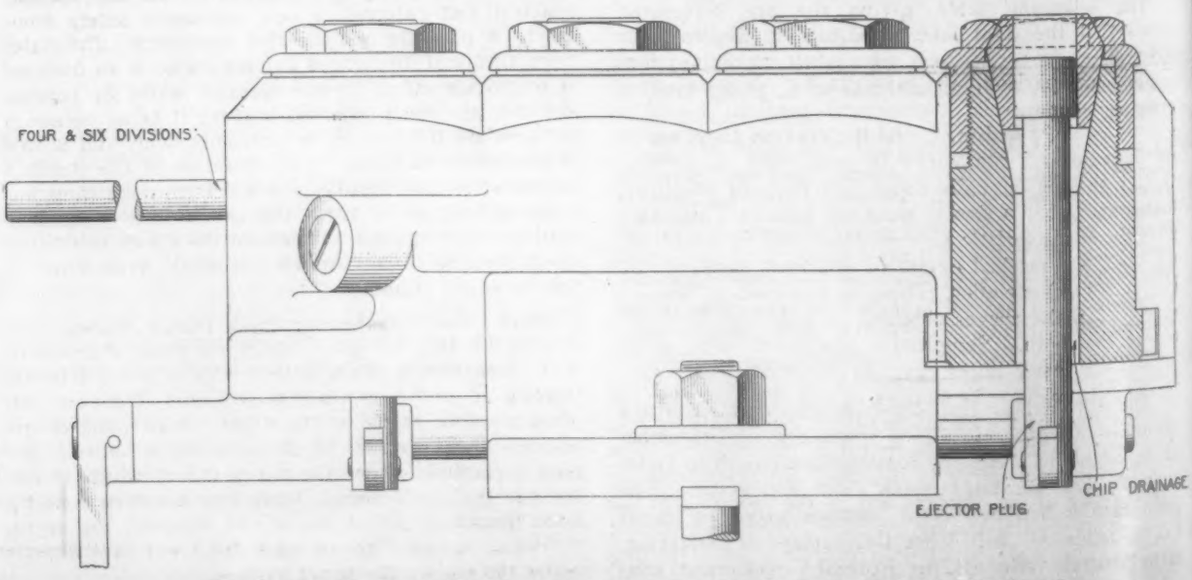
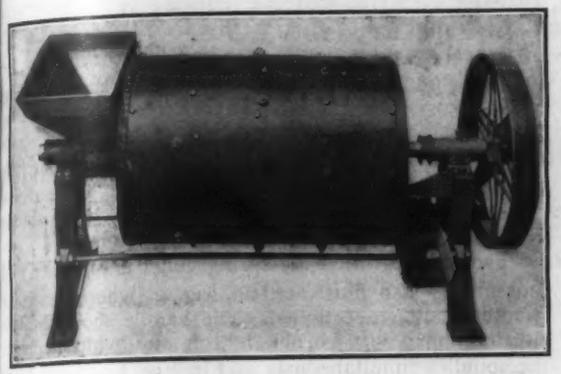


Fig. 2.—Elevation Partly in Section of the Garvin Four-Spindle Vertical Indexing Attachment.

rotated through the pulley at the end of the shaft until the sand has become thoroughly cleansed, and about 12 cu. yd. of washed sand is recovered, the difference being largely the other ingredients which are washed out.

The savings effected by the use of this machine include not only the cost of the new sand, but the eliminated expense of hauling it to the dump. In the H. B. Smith Company's plant at Westfield, Mass., where the



The No. 13 Core-Sand Washer Made by the Osborn Mfg. Company, Cleveland, Ohio.

core sand washer was originated, very satisfactory cores have been made using from 50 to 100 per cent. of washed sand. In one test, out of 140 cores set, only one was lost. In another test recently made with radiator cores, using all washed sand and Osborn No. 1 core oil, 38 to 1, 90 cores produced 87 good castings. It is claimed that no more oil is required with the washed sand than with new sand.

Lake Ore Shipments to September 1

The August movement of Lake Superior iron ore by water was slightly more than that for July—6,964,381 tons against 6,945,289 tons—though a decrease was expected. It is now the expectation that after a fairly full movement this month there will be a pronounced curtailment in October. The policy of the United States Steel Corporation is to clean up its shipments early and thus avoid the risks of late trips which in a number of recent years have been attended with very considerable losses. Estimates of shippers in position to gauge fairly the situation now put the probable movement this year midway between the 41,683,599 tons shipped by water in 1909 (903,270 tons additional going by all-rail routes) and the 50,000,000 tons of the optimistic estimates made for 1910 at the opening of the year.

The following table, giving the ore movement, shows that the total lake shipments to September 1 were 28,827,029 gross tons, as against 22,588,549 tons to September 1, 1909, an increase of 6,238,480 tons, or 27.61 per cent.:

Port.	August, 1909.	August, 1910.	To Sept. 1, 1909.	To Sept. 1, 1910.
Escanaba	1,037,341	697,412	3,053,845	3,162,271
Marquette	542,607	525,898	1,413,568	2,249,774
Ashland	639,981	645,107	1,790,769	2,878,971
Superior	1,110,213	1,332,284	3,686,323	5,227,687
Duluth	2,279,242	1,382,156	7,713,377	9,823,644
Two Harbors	1,584,215	1,381,524	5,020,667	5,484,682
Totals	7,193,199	6,964,381	22,588,549	28,827,029
Increase, 1910	.....	*228,818	6,238,480	.....

* Decrease.

The Appalachian Exposition, a demonstration of the resources and progress of the South, opened September 12 in Knoxville, Tenn., to continue one month to October 12. The buildings cover about 100 acres. The main exhibit building alone contains 80,000 sq. ft. of exhibit space. It will house the displays of commerce, manufactures, railroads, the Federal Government, educational institutions and fine arts. It is a permanent structure, built entirely of materials produced in the Appalachian Mountain regions.

New Tools and Appliances

Duplex Vacuum Cleaning Machine.—The Keller Mfg. Company, Twenty-first street and Allegheny avenue, Philadelphia, Pa., is making a new vacuum cleaner similar in principle to other machines of its type, but having two diaphragm air pumps driven by a single motor making it smaller for a given capacity. The pumps are mounted one above the other, the lower on a cast iron base and the upper on four pipe columns. A ¼-hp. driving motor is mounted on a bracket midway between the pumps, and the shaft is extended at both ends and carries two ball-bearing eccentrics and a flywheel. Each pump is driven by two links which are run from the proper eccentric. The operating mechanism is inclosed in a sheet steel cylinder and above this is the dust collector comprising a sheet steel shell with a heavy felt bag inside, both of which inclose a drill dump bag. The machine is not portable and is connected to the house piping by a 5-ft. length of rubber hose. The dust-laden air enters the upper chamber and is there relieved of its burden. It then passes directly to the upper pump in part, while the balance goes down the pipe columns to the lower one. After passing through the pumps, the strained air is blown out around the motor and escapes through an opening in the casing. No special foundation and no water nor sewer connections are required. The size of the motor is limited so that it can be operated from lighting circuits through ordinary push buttons or snap switches and conform to the Underwriters' requirements without using special wiring.

Speed Controlling Rheostats.—The General Electric Company, Schenectady, N. Y., has brought out a line of speed controlling rheostats in which an effort has been made to combine in a single box both armature and field regulating rheostats, and to effect all speed changes by the movement of a single arm, which is held in any position by a mechanical device. Rheostats for machine tool service where the full load current is taken at low speeds in order that the motors may maintain a constant torque, and others for fan service where the load increases with the speed are included. A no voltage release is provided to prevent damage from the current being turned on without any resistance in series with the motor armature. The contact segments are of liberal size and are so designed that they may be renewed easily and quickly, and the resistance units are of an improved design, so constructed as to be nonbreakable and thoroughly ventilated.

Safety Stop-Clutch.—C. F. Heinss of the Queen City Punch & Shear Company, Cincinnati, Ohio, has recently designed and patented a new automatic safety stop-clutch for punching and shearing machinery. The clutch is engaged and disengaged automatically, is so designed as to provide safety for the operator while the punches and dies are being adjusted without it being necessary to throw off the belt, as is commonly done, and is said to be positive in action. The operation of the clutch is controlled by foot treadle, which acts through cams and a spring plunger to force the clutch into engagement with the driving gear. If desired the clutch can be entirely disengaged by throwing a small hand lever on the top of the frame.

Device for Transferring Prick Punch Marks.—The E. C. Bliss Mfg. Company, 91 Sabin street, Providence, R. I., is making a handy little device which is intended to transfer prick punch marks accurately from one side of a piece of work to the other. Two punches are utilized, the lower of which is spring actuated. The piece is brought under the upper punch, which is centered in the punch mark. When this has been done the lower punch is pulled down and released, the spring providing enough force to mark the lower face directly under the one on the upper surface.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅝ in. round and square	₩ lb 1.90¢
1⅛ to 4 in. x ⅜ to 1 in.	
1½ to 4 in. x ¼ to 5-16	₩ lb 2.10¢
Rods—⅜ and 11-16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 5 16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ¼ in.	2.20¢
1½ to 2¾ in. x 5-16 in. and thicker	2.10¢
1 to 1¼ in. x 5-16 in.	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
⅝ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ¼ in.	3.55¢
½ x 3-32 in.	4.35¢

Tees:	
1 in	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 5-16 in	2.35¢
3 in. and larger	2.15¢

Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₩ lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50¢3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

black	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ lb 3.20¢
Nos. 22 to 24	₩ lb 3.55¢
No. 26	₩ lb 3.75¢
No. 28	₩ lb 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.00
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 11, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 8 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 36¾

Copper—

Lake Ingot	₩ lb 14¾
Electrolytic	₩ lb 14¾
Casting	₩ lb 14¼

Spelter—

Western ₩ lb 6¼

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb

Lead.

American Pig	₩ lb 5
Bar	₩ lb 6¼

Solder.

½ & ½, guaranteed	₩ lb 22¼
No. 1	₩ lb 20
Refined	₩ lb 18

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb
Hallett's	
Other Brands	

Bismuth—

Per. lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in lots for remelting

Rods & Wire Base Price

Sheets Base Price

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.75@
Copper, Heavy and Wire	₩ lb 10.50@
Copper, Light and Bottoms	₩ lb 9.50@
Brass, Heavy	₩ lb 7.25@
Brass, Light	₩ lb 6.75@
Heavy Meching Composition	₩ lb 9.50@
Clean Brass Turnings	₩ lb 7.00@
Composition Turnings	₩ lb 8.25@
Lead, Heavy	₩ lb @
Lead, Tea	₩ lb @
Zinc Scrap	₩ lb @

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